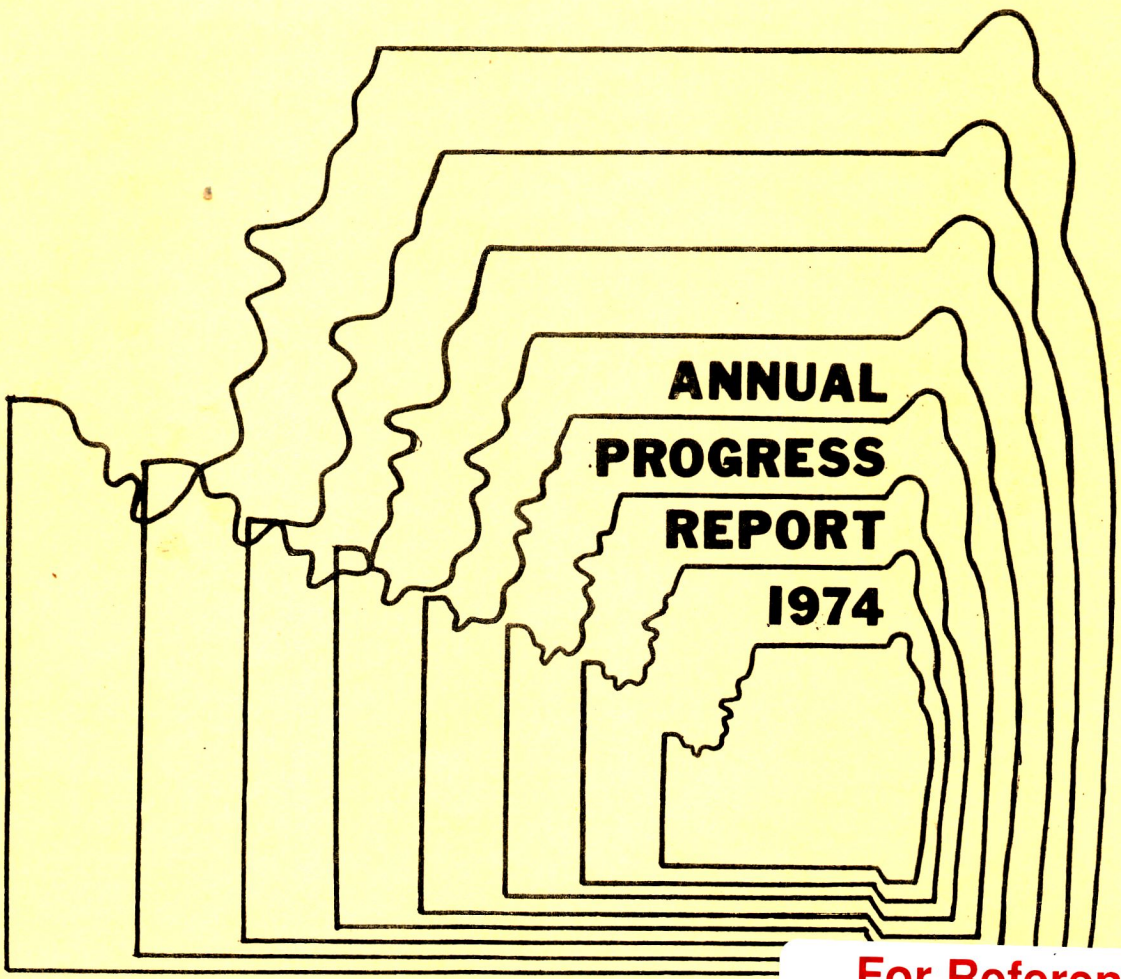
PALM BEACH COUNTY, FLORIDA

AIR POLLUTION CONTROL PROJECT

ENVIRONMENTAL PROTECTION AGENCY

GRANT NO. A004022-75-0



PALM BEACH COUNTY HEALTH DEPARTMENT

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I

INTRODUCTION

Palm Beach County is located along the southeast coast of Florida, and is part of what is generally called the "Florida Gold Coast". The " Gold Coast " consists of four counties: Palm Beach, Broward, Dade, and Monroe. Palm Beach County is geographically separated into two regions: one region is a highly urbanized coastal strip, stretching approximately forty-five (45) miles from Tequesta on the north, to Boca Raton on the south; and the other is agricultural, located in the western portion of Palm Beach County (the Glades Area).

The population distribution within the County depicts this same unusual pattern. Virtually all of the population is located in two relatively small areas: the coastal strip adjacent to the Atlantic Ocean and along a narrow band adjacent to Lake Okeechobee.

The majority of the population, approximately 90%, is located on the coast for a distance of approximately ten miles inland from the Atlantic Ocean. Cities which are included in this coastal strip are: Tequesta, Jupiter, Juno Beach, Riviera Beach, West Palm Beach, Palm Beach, Lake Worth, Boynton Beach, Delray Beach, and Boca Raton.

Tourism and related fields continue to be the major economic factors of this area. Tourism has increased along with increased population. A good indicator of

this increase is the number of passengers deplaning at Palm Beach International Airport. In 1974, 685,345 passengers deplaned as compared to 650,151 passengers deplaned in 1973, an increase of approximately 6%. A combination of airline strikes, fuel crisis, and general economic conditions are responsible for the limited increase in passengers deplaning for 1974. Other major industries in the area include building construction and related fields, agriculture, aircraft testing facility, cement and concrete, asphaltic concrete, and the service industries.

The band adjacent to Lake Okeechobee contains virtually all of the remaining 10% of the County's population. Cities which are included in the Glades area are: Belle Glade, Pahokee, and South Bay. The economy of this area is an agricultural one, based principally on sugarcane and winter vegetables.

The complexity of the problems of Air Pollution Control are related to the widespread growth of Palm Beach County. Advances in environmental protection activities, which are being carried out by this program, have been utilized in order to keep abreast of these air pollution problems during the past twelve (12) months. These activities are characteristic of urban areas across the nation.

Among the many activities that the Air Pollution Section of the Palm Beach County Health Department

has implemented is the administration of the state permit system. The Department of Pollution Control requires both a permit to construct and a permit to operate any air pollution source. As administrator of the permit system, this local program is in the position to prevent the improper construction of a pollution source and to assure that adequate pollution control equipment is utilized and maintained.

Other activities include: consultations with industries and engineers on impending permit action; enforcement action; complex source requirements; and required compliance schedule and increments of progress surveillance. Also, this local program investigates and initiates the necessary follow-up action regarding all citizen complaints. As part of the State Air Implementation Plan, this agency is required to conduct source surveillance and source inspection of existing and new sources in Palm Beach County, in order to assure that all sources are in compliance with all the County and State air pollution regulations.

The air monitoring capabilities of this program continue to be the ultimate means of maintaining Air Quality Standards for Palm Beach County. The Environmental Control Air Monitoring Laboratory, which is located in West Palm Beach, has the capabilities of measuring: Total Hydrocarbons(THC), Carbon Monoxide (CO), Sulfur Dioxide (SO_2), Nitrogen Dioxide (NO_2), Ozone (O_3),

and four meteorological parameters (Wind Speed, Wind Direction, Temperature, and Relative Humidity). All the aforementioned data are collected through the use of recorders plus a centrally controlled digital data acquisition system. The data is then transcribed on SAROAD (Storage and Retrievel of Aerometric Data) forms for input into the National Aerometric Data Bank.

A second completely continuous monitoring meterorological system (wind speed, wind direction, temperature, and relative humidity) is being employed in the mobile air monitoring step-van, used in sampling of selected areas during periods of special interest. Additionally, the air pollution control program has continued its monitoring for the frequency and intensity of temperature inversions at the Division of Forestry's observation tower located at Loxahatchee, Florida.

The present monitoring network includes twelve high volume particulate sites; one continuous monitoring site; one mobile monitoring van; two nitrogen dioxide bubblers sites, used to measure concentrations of nitrogen dioxide. In addition, a chemistry laboratory located in Riviera Beach handles all analysis pertaining to air pollution.

An "Air Pollution Index", consisting of the latest concentrations of both ozone and suspended particulate, and the percent of the standard level for each has been disseminated throughout the year to a local television

station and two local newspapers twice each day.

The residents of Palm Beach County are becoming more aware of the need for a thorough Air Pollution Program. In an effort to satisfy these needs, this program has increased in scope. This has been necessary to keep abreast of the requests of the people of Palm Beach County, to maintain reasonable air quality, and protect the health and welfare of all concerned.

TABLE I
PALM BEACH COUNTY, FLORIDA
POPULATION

	U. OF FLA DIVISION OF POPULATION STUDIES 1972	(ESTIMATES) 1973	A. P. B. 4-1-74
Atlantis	724	844	1,072
Belle Glade	17,105	17,077	16,543
Boca Raton	37,590	38,874	45,371
Boynton Beach	24,091	26,507	33,817
Briny Breeze	918	689	798
Cloud Lake	136	136	136
Delray Beach	23,722	25,046	29,620
Glen Ridge	216	233	231
Golf Village	52	54	120
Golfview	198	207	217
Greenacres City	2,884	2,949	2,516
Gulf Stream	455	474	491
Haverhill	1,078	1,081	1,104
Highland Beach	1,358	1,406	1,281
Hypoluxo	342	354	899
Juno Beach	850	883	1,004
Jupiter	4,624	5,358	5,718
Jupiter Inlet Colony	432	448	464
Lake Clarke Shores	2,565	2,694	2,895
Lake Park	7,470	7,927	8,553
Lake Worth	25,179	25,934	27,767
Lantana	7,357	7,826	8,941
Manalapan	226	235	261
Mangonia Park	862	885	1,356
North Palm Beach	10,923	12,056	12,545
Ocean Ridge	1,139	1,155	1,169
Pahokee	5,093	5,944	5,994
Palm Beach	10,040	9,742	9,457
Palm Beach Gardens	7,620	8,315	9,331
Palm Beach Shores	1,526	1,419	1,428
Palm Springs	5,550	6,288	8,254
Riviera Beach	23,663	25,164	26,872
Royal Palm Beach	1,080	1,621	1,910
South Bay	3,050	3,026	3,124
South Palm Beach	318	367	1,564
Tequesta Village	3,655	3,798	4,126
West Palm Beach	59,293	61,663	65,876
Total Incorporated Area	293,342	308,679	342,825
Unincorporated	95,268	119,304	150,071
Total	388,610	427,983	492,896

II

METEOROLOGY

GENERAL

Topography is of primary importance whenever the meteorological aspects of a given region are to be evaluated. Palm Beach County is a fairly level region. For the most part, Palm Beach County is between 10 and 20 feet above sea level. All urban development is located along the eastern 10 miles of the coastal strip. Most of the western portions of the County are covered by agricultural lands or everglades. The agricultural lands are endowed with a rich peat-like "muck" soil. The Atlantic Ocean borders the eastern edge of the County and the Gulf Stream flows northward approximately 3 miles off-shore. Seldom does a cold air mass reach this region without being modified, due to marine influences and our southern location. Light freezes occur infrequently along the coastal areas of the County and more frequently in the everglades and agricultural areas. The most eastern parts of the County come under the influence of the sea breeze during the day and land breeze during the night. Based on weather data accumulated at Palm Beach International Airport for the past 29 years, August is the warmest month with a mean of 83° F, a maximum mean of 91.1° F, and minimum mean of 74.8° F. From the same data, January is the coldest month with a mean of 66.9° F, a maximum mean of 75.5° F and a minimum mean of 58.3° F. Rainshowers and/or thunderstorms of short duration are frequent during the summer season. Palm Beach County receives the greatest amount of

rainfall during the summer and fall. As indicated in Table 2, in the past 29 years of record the County received approximately 61.7 inches of rain per year.

Palm Beach County can be classified as a semi-tropical region. The Quasi-permanent location of the "Bermuda" high pressure area governs our weather. It causes our prevailing easterly surface winds in addition to supplying the warm moist air necessary to produce the frequent air mass, frontal or nocturnal rainshowers and/or thunder-storms that occur in the County. The position of the "Bermuda" high pressure area is also conducive to the formation of an atmosphere capable of causing high pollution days. This atmosphere can easily occur if cold air from the north moves underneath the warm moist air brought into the County by the "Bermuda" high. The result is a temperature inversion or increase of temperature with height which traps the pollutants in the lower levels.

Meteorological parameters play a significant role in understanding the over-all air pollution cycle. The motions of the atmosphere are extremely variable and must be thoroughly examined in order to determine the movement and dispersement of pollutants.

WIND

Both wind direction and wind speed are of primary importance. The surface wind and the wind found in

the first few hundred feet of our atmosphere must be studied to determine diffusion and movement of the pollutants. The wind direction is indicative of the direction of travel of the pollutants. The wind speed determines the time it takes the pollutants to travel to a receptor and the amount of dilution of the pollutant is also a function of the speed. Light winds, coupled with other factors, contribute to poor air quality episodes. U. S. Weather Service records for Palm Beach International Airport show the prevailing wind directions for the months of February through November are from one of the easterly headings. Mean monthly speeds vary between 7.4 knots in August and 10.8 knots in April (Table 2). The wind direction and speed for the year 1974 (Table 3) shows that a higher percentage of winds were from the east or east southeast directions and the majority of the wind speeds were in the 7-10 knot category.

ATMOSPHERIC STABILITY

The dilution of pollutants in the atmosphere depends greatly on the vertical temperature gradient in the first few hundred feet of the atmosphere. When the vertical temperature gradient decreases with height the atmosphere is unstable and good dilution of pollutants is the result. This normally occurs in Palm Beach County during the summer season and/or the warmer hours of each day. If the

TABLE 2
MEANS AND EXTREMES
PALM BEACH COUNTY AIRPORT (1931 - 1960)

MONTH	MEAN MAXIMUM TEMPERATURE	MEAN MINIMUM TEMPERATURE	MEAN MONTHLY TEMPERATURE	MEAN MONTHLY PRECIP. (IN.)	PREVAILING WIND DIRECTION	MEAN WIND SPEED
JANUARY	75.5	58.3	66.9	2.48	NW	10.0
FEBRUARY	76.5	58.6	67.6	2.35	SE	10.4
MARCH	78.6	61.1	69.9	3.44	SE	10.7
APRIL	82.4	65.4	73.9	4.34	E	10.8
MAY	85.9	69.2	77.6	5.11	ESE	9.6
JUNE	89.2	72.7	81.0	7.53	ESE	8.0
JULY	90.8	74.3	82.6	6.66	ESE	7.5
AUGUST	91.1	74.8	83.0	6.74	ESE	7.4
SEPTEMBER	89.7	74.5	82.1	9.66	ENE	8.8
OCTOBER	85.2	71.1	78.2	7.96	ENE	10.0
NOVEMBER	80.2	64.8	72.5	2.86	ENE	9.9
DECEMBER	76.9	59.4	68.2	2.57	NNW	9.7
YEAR	83.5	67.0	75.3	61.7	ESE	9.4

TABLE 3
PALM BEACH INTERNATIONAL AIRPORT (P.B.I.A.)
WIND DIRECTION AND SPEED (KNOTS) OCCURRENCES - YEAR 1973

DIRECTION	1-3	4-6	7-10	11-16	17-21	22-27	TOTAL	PERCENT
35-36-01 (N)	3	22	27	13	6	1	72	2.5
02-03-04 (NNE)	2	11	24	45	13	4	99	3.4
05-06-07 (ENE)	2	22	110	157	49	2	342	11.7
08-09-10 (E)	7	40	139	205	26	0	417	14.3
11-12-13 (ESE)	8	100	202	136	10	0	456	15.6
14-15-16 (SSE)	13	67	93	91	9	0	273	9.3
17-18-19 (S)	21	89	55	16	1	0	182	6.2
20-21-22 (SSW)	10	67	37	18	10	0	142	4.9
23-24-25 (WSW)	16	72	41	16	0	0	145	5.0
26-27-28 (W)	15	90	29	21	2	1	158	5.4
29-30-31 (WNW)	20	64	65	45	3	0	197	6.8
32-33-34 (NNW)	11	74	47	29	6	0	167	5.7
CALM	270						270	9.2
TOTAL	398	718	869	792	135	8	2920	
PERCENT	13.6	24.6	29.8	27.1	4.6	0.3		100.0

Multiply by 1.15
to obtain M.P.H.

vertical temperature gradient increases with height within the first few hundred feet of the atmosphere, a stable condition is caused, often called an inversion, which results in poor dilution of pollutants. This occurs in Palm Beach County more frequently during the winter and fall seasons and/or the cooler hours of each day. If pollutants are present during these periods they are trapped beneath the inversion and remain there until the inversion is dissipated by surface heating.

The U.S. Weather Service at Palm Beach International Airport can not measure the vertical temperature gradient in our region with their present equipment. We therefore rely upon the rawinsonde (measuring device) data taken at Miami and Tampa. Interpolation procedures are necessary in order to determine stability conditions in Palm Beach County. Table 3A shows Miami and Tampa taken from C.R. Hosler's report entitled, "Low Level Inversion Frequency in the Contiguous United States" (1961).

TABLE 3A

Percent Frequency of Occurrence of Inversions with Base Less than 500 Feet Above Station Elevation

	MIAMI				TAMPA			
TIME (EST)	1900	2200	0700	1000	1900	2200	0700	1000
FALL	19	41	73	3	25	63	76	2
WINTER	29	39	60	6	28	69	60	17
SPRING	10	27	47	2	7	69	52	1
SUMMER	21	27	65	2	14	62	57	8

Based on the percentages shown in the above table it is reasonable to assume that inversions with a base less than 500 feet occur in Palm Beach County during the fall and winter seasons between the hours of 2000 (8:00 P.M.) and 0800 (8:00 A.M.) 50% of the time. The inversion frequency percentages for the spring and summer seasons during the same time frame are also substantial and should not be overlooked in the course of a pollution study. At this time it is interesting to note two important thoughts: (1) Hosler only considered very shallow inversions (less than 500 feet), yet inversions with higher bases are also capable of causing poor air quality; (2) the interior area of Palm Beach County experience lower night time temperatures and therefore must have a higher frequency of inversions, especially during the fall and winter seasons.

C.R. Hosler's report was strengthened by Mr. Harold P. Gerris of the Meteorology Department of the University of Miami who conducted a thorough study and prepared a paper entitled, "Analysis of Low-Level Temperature Inversions in the Miami Area Using Instrumented Towers". He placed two instrumented towers in the Miami Area, one on the coast and the other 16 miles inland. The analysis of the temperature data revealed that nocturnal inversions occurred almost every night within 200 feet of the ground. The inversions that occurred inland were 3-4 times stronger than those that occurred on the coast. The inversions lasted approximately 10 hours inland. He showed that the inversions formed shortly after sunset and dissipated shortly after sunrise. The sampling period began on February 17, 1971, and lasted until May 27, 1971.

MIXING HEIGHTS

The mixing height or depth is defined as the height above the surface through which vertical mixing takes place. The mixing height value depends on the local stability of the atmosphere and the surface temperature. The greatest mixing height values occur during the summer season and warmer hours of the day. The minimum mixing height values occur during the winter season and cooler hours of the day. Mixing heights are a function of atmospheric stability. The greater the mixing height the greater amount of air available to dilute a pollutant.

Table 3B shows mixing height data for Palm Beach County, Miami, and Tampa taken from G.C. Holworth's Report entitled, "Mixing Heights, Wind Speeds and Potential for Urban Air Pollution Throughout the Contiguous United States". (1971)

TABLE 3B

SEASONAL MEAN MIXING HEIGHTS IN FEET ABOVE GROUND ELEVATION FOR MORNING HOURS AND AFTERNOON HOURS. (DAYS WITH NO PRECIPIATION)

	PBC (INTERPOLATION)		MIAMI		TAMPA	
	Mrn.	Aft.	Mrn.	Aft.	Mrn.	Aft.
FALL	2640	4290	2877	4339	1382	4623
WINTER	2310	3960	2158	3986	1300	3471
SPRING	3052	4620	3125	4752	1659	5025
SUMMER	3382	4290	3435	4488	2164	4818
ANNUAL	2846	4267	2897	4389	1626	4484

The values in the above table clearly show that on the average, the greatest volume of air for the mixing of pollutants is available during the afternoon hours. The fall and winter seasons experience the least volume of air available for mixing, especially during the morning hours and therefore are subject to a greater potential for poor air quality.

CONCLUSION

Recently, the Air Pollution Section of the Palm Beach County Health Department was allowed to install

temperature radiation shields on the Division of Forestry Observation tower at Loxahatchee, Florida. The shields were placed at the 25 foot, 50 foot, and 100 foot levels. The equipment continuously collects data in order to monitor the frequency and strength of low level inversions and mixing heights. The data collected thus far verifies the existence of frequent low level inversions and shallow mixing heights during evening and early morning hours.

Meteorological parameters during the spring and summer seasons in Palm Beach County are more favorable for good air quality than the fall or winter seasons. The fall and winter season experience a higher frequency of inversions (stable air), less rain fall (cleaning agent) and more shallow mixing heights (small volume of air for dilution), all of which hinder the diffusion of pollutants.

As time goes on and more of the aforementioned meteorological studies become available, it will become increasingly evident that serious nocturnal inversions exist. Good planning, therefore, will be mandatory prior to the construction of any industrial complexes in order to curtail future pollution problems.

III
COMPLAINTS & INVESTIGATIONS

During the period January 1, 1974 through December 31, 1974, a total of 147 complaints dealing with air pollution, noise pollution and odors were received and investigated by the Air Pollution Control Office staff. These complaints can be classified as follows:

1. Industrial Fumes or Dust 17
2. Commerical Incinerators..... 3
3. Open Burning 58
4. Internal Combustion Engine Fumes and exhaust 10
5. Odors from all sources 25
6. Construction Dust and Fumes 1
7. Noise from all sources 17
8. Pollen Deposits 2
9. Unknown Sources 6
10. Miscellaneous Sources 8

Overall complaints and investigations for this period dropped 16% as compared to the previous period. In the open burning category, complaints were down 21% from last year. This decrease can be attributed to continued co-operation by the land clearing contractors, the agricutural interests and the local fire departments. Another factor in the drop in complaints due to open burning, is the fewer construction or development starts this year.

Open burning complaints for this reporting period were as follows: dumps 2, landclearing 26, agricultural 15 and others 15.

Only three categories of complaints were higher in number this year as compared with last. Unknown source complaints were up slightly, noise complaints were up 18%, and odor complaints were up over 700%.

Most of the unknown source category complaints were from odors that were either undetectable by representatives of this agency or untraceable. Noise complaints continue to increase due to the rise in commercial and/or industrial activity at the same time the area is experiencing continued population growth. The large increase in odor complaints is the result of a different method of reporting, industrial activity increase and population increase. In prior years, only food establishment odors were reported in the odor category, all other odor complaints were reported under miscellaneous sources. Most of the odor complaints that result from commercial or industrial activity come from areas where residential zones abut commercial zones.

Open Burning Authorization Investigations were up over 100% this year with a total of 230 requests, 203 requests being approved and 27 requests being denied. The denials, in some instances, were due to atmospheric conditions at the time of the request, but in most cases were because of the applicant not being able to comply with Chapter 17-5 Florida Administrative Code, which regulates open burning and frost protection fires. The large increase in open burning

authorization requests is the result of better co-operation by the rural fire districts. Formerly, the fire districts did not require authorization by this agency before issuing a fire permit to a rural home owner to burn grass and shrubbery clippings for property enhancement.

Complaints about odors and smoke from incinerators continued to decline this year. This decline is directly related to the number of incinerators taken out of service during the 1973 reporting period in which all grocery store incinerator use in Palm Beach County was discontinued.

IV
TRAINING

Air Pollution Control personnel attended training courses and workshops as follows:

1. Mr. Terry D. Heath, Mr. John W. Humphries, Mr. Michael J. Martin, and Mr. Wayne J. Williams completed the self-instructional "Air Pollution Control Orientation Course" (#422-A).
2. Mrs. L. M. Field attended Florida Atlantic University course, "Traffic Noise Abatement", at Boca Raton, Florida on February 4-8, 1974.
3. Mr. Eugene J. Sacco attended the Department of Pollution Control workshop, "Complex Sources", at Orlando, Florida on March 11, 1974.
4. Mr. Terry D. Heath attended the National Incinerator Conference, ASME at Miami Beach, Florida on May 12-14, 1974.
5. Mr. Dennis O. Myers attended the Quality Assurance Workshop concerning Air Pollution Analyzer Calibration at Athens, Georgia on July 3-12, 1974.
6. Mr. Robert E. Milkins and Mr. Eugene J. Sacco attended the Department of Pollution Control course "Visible Emission Evaluation" at Orlando, Florida on July 10, 1974.
7. Mrs. L.M. Field and Mr. Michael J. Martin attended the Department of Pollution Control workshop "Air Pollution - General Consideration", at

Ft. Lauderdale, Florida on August 14, 1974.

8. Mr. Terry D. Heath and Mr. Michael J. Martin attended the Department of Pollution Control course "Visible Emission Evaluation" at Orlando, Florida on September 9, 1974.

9. Mr. Michael J. Martin attended the Environmental Protection Agency Course #452 "Principles and Practice of Air Pollution Control" at New York, New York on September 23-27, 1974.

10. Mrs. L. M. Field attended the Department of Pollution Control workshop "Meteorological Effects on Dispersion of Air Pollutants" at Ft. Lauderdale, Florida on September 27, 1974.

11. Mrs. L. M. Field and Mr. Michael J. Martin attended the Department of Pollution Control workshop "Vehicles Sound Measurments" at Miami, Florida on October 7, 1974.

12. Mrs. L.M. Field and Mr. Michael J. Martin attended the Department of Pollution Control workshop "Ambient Air Sampling and Analysis" at Ft. Lauderdale, Florida on October 17, 1974.

13. Mr. Terry D. Heath attended the Environmental Protection Agency Course #415 "Control of Gaseous Emissions" at Philadelphia, Pennsylvania on October 29 - November 1, 1974.

14. Mr. Terry D. Heath attended the Environmental Protection Agency Course #413 "Control of

Particulate Emission" at Philadelphia, Pennsylvania on November 4-7, 1974.

15. Mr. Michael J. Martin attended the Department of Pollution Control workshop "Control of Particulate" at Ft. Lauderdale, Florida on November 19, 1974

16. Mr. Steve Hood and Mr. Wayne J. Williams attended the Palm Beach County Civil Defense course "Radiological Monitoring" at West Palm Beach, Florida on November 20-21, 1974.

17. Mr. Michael J. Martin attended the Department of Pollution Control Seminar "Control Equipment and Monitoring" at Orlando, Florida on December 4-5, 1974.

18. Mrs. L.M. Field and Mr. Michael J. Martin attended the Department of Pollution Control workshop "Source Sampling and Analysis" Ft. Lauderdale, Florida on December 19, 1974.

V
PUBLIC RELATIONS

Public Relations activities accomplished by the Palm Beach County Health Department, Air Pollution Control Program, in the past year have consisted of increased efforts to inform the general public of the problems and the programs of the local air pollution office. These activities include: the distribution of the air pollution control's Annual Progress Report to citizen groups, local officals, and industry; Extending invitations to groups of school children and ecology clubs to visit the Air Monitoring Trailer; and presentations to school students throughout the county on the topic of "Air Pollution Control in Palm Beach County."

A major aspect of the Local Air Pollution's public relations program is the transmission, twice daily, of a "Pollution Index" to the local media.

This Pollution Index consists of the latest suspended particulate matter and ozone concentrations and the percent of the air quality standard that those levels represent.

Some of the more significant activities that the personnel of the air pollution program have participated in are as follows:

1. Staff personnel assist, guide and provide the necessary data to students for their environmental studies and reports.
2. Mr. Eugene J. Sacco served, as a member on the Technical coordinating Committee of the West Palm Beach Urban Area Transportation Study.

3. Mr. Eugene J. Sacco, in an advisory capacity, attends the American Lung Association meetings.
4. Mr. Eugene J. Sacco talked to the Division of Forestry,Loxahatchee, referrence Chapter 17-5, F.A.C. - Open Burning.
5. Mr. Eugene J. Sacco appeared on a local television program to explain "Air Pollution in Palm Beach County".
6. Mr. Eugene J. Sacco attended the annual meeting of the Florida Section of the Air Pollution Control Association in Tampa, Florida on September 30, 1974.
7. Mr. Michael J. Martin appeared on a local television program to explain the most feasible method of destruction of narcotic substances, (i.e.) Incineration.
8. Special Air Pollution Statement was issued on May 2, 1974, by the Air Pollution Section of the Palm Beach County Health Department regarding smoky condition in Palm Beach County.
9. Special Air Pollution Statement was issued on May 6, 1974, by the Air Pollution Control Section, PBCHD, regarding smoky conditions in Palm Beach County.
10. Special Air Pollution statement was issued on May 30, 1974, by the Air Pollution Control Section, PBCHD, regarding smoky conditions in Palm Beach County.
11. Mr. Michael J. Martin presents before the Palm Beach County Health Department Employee's Orientation, bi-monthly, an orientation program.

VI

SURVEILLANCE AND ENFORCEMENT

The Air Pollution Section of the Palm Beach County Health Department (PBCHD) continues to operate in accordance with the contractual agreement established in the previous year with the Florida Department of Pollution Control (DPC). The agreement enables the County and DPC to more readily meet the requirements set forth in the State Air Implementation Plan (SIP) with a minimum of expense, duplication of effort and facilities.

During calendar year 1974 Palm Beach County appointed an attorney to occupy the Environmental Control Officer (ECO) position. The ECO's statutory duty is to enforce all of Palm Beach County's health and pollution control statutes.

The agriculture exemption described in Section 15½ - 8, Palm Beach County Code has caused some trouble in recent years. In view of this, another attempt to remove the exemption was generated during this period and additional efforts will be initiated in subsequent years to achieve removal of the agriculture exemption.

The exemption precludes our agency from regulating agricultural related environmental matters. Consequently, as agents of the DPC and in accordance with aforementioned contractual agreement, our agency maintains a strong liason with the DPC to monitor compliance of State of Florida air pollution laws as prescribed in the SIP. The arrangement has proven to be adequate and provides substantial legal authority to the PBCHD to regulate agricultural related

environmental matters.

Currently the Air Pollution Control section provides the following services in order to comply with surveillance and enforcement directives prescribed in the Palm Beach County Code and the Florida State Implementation Plan:

1. Reviews construct and operate permit applications and recommends approval or disapproval of same.

2. Maintains records on permits, surveillance and enforcement actions.

3. Monitors compliance schedules and increments of progress.

4. Inspects existing and new sources.

5. Investigates all Citizen complaints.

6. Prepares enforcement summaries for all violations.

7. Monitors stack sampling procedures.

8. Conducts aerial and ground surveillance programs.

A total of 56 formal and informal violations were recorded and issued during this reporting period. They included:

1. Nineteen (19) violations of Chapter 17-2, Florida Administrative Code (FAC), entitled "Air Pollution."

   a. Twelve (12) - paragraph 17-2.04(2) and paragraph 17-2.04(7), Visible Emissions from Stationary and Mobile Sources respectively.

   b. Three(3) - paragraph 17-2.04(5), Volatile Organic Compounds.

   c. Three(3) - paragraph 17-2.04(3), Fugitive Particulate.

d. One(1) - paragraph 17-2.04(4), Objectionable Odor Prohibited.

2. Eight(8) violations of Chapter 17-4 FAC, entitled "Permits." More specifically - facilities operating an air pollution source without a valid permit.

3. Twenty-nine(29) Violations of Chapter 17-5 FAC, entitled "Open Burning and Frost Protection Fires." The majority of which were agriculture and land clearing fires.

All but two(2) of the above cases were closed using voluntary compliance procedures. One volatile organic compounds emission case was brought before the Palm Beach County Environmental Hearing Board. The case is pending and should close within the next six(6) weeks. One visible emission violation from a stationary source (agriculture) case was brought before the DPC Southwest Region office for compliance.

A more intense surveillance and enforcement program initiated by the Air Pollution Control section has generated a greater cognizance of current air pollution rules and regulations.

Good air quality is a precious commodity and it must be protected through the use of effective surveillance and enforcement procedures.

VII

ENGINEERING EVALUATIONS

1974 was an unusually busy year for the Air Pollution engineering personnel. In addition to normal construction, particular emphasis was placed upon the Sugar Cane and Cement Batch Industries with regard to control of their emissions.

Many engineering evaluations were conducted during this report period. A brief description of some that were reviewed with specific recommendations sent to the Department of Pollution Control, follows:

1. Boilers and peripheral equipment generally associated with steam heat and/or cleaning (Laundry). This includes all boilers rated 150HP or more and which have the capability of burning distillate or residual oil. Applications were received for permit to operate and approval recommended to the Department for the following:

   Bethesda Hospital - 150 HP.

   Good Samaritan Hospital - 830 HP.

   J. F. Kennedy Hospital - 260 HP.

   National Linen Service - 600 HP.

   Palm Beach Junior College - 150 HP.

2. Boiler used to produce steam for commercial industrial uses.

   Florida Power & Light - 4 boilers

   Lake Worth Utilities - 4 boilers

   Florida Vacuum Cooling - 1 boiler

Quaker Oats Company - Superheater

3. Sugar Cane Industry has been planning and constructing controls for all bagasse fired boilers. These controls generally consist of a wet scrubber to remove particulate. Fourteen (14) applications for construction of control devices have been reviewed. Recommendation for approval was given to the Department, after necessary field inspections of the seven (7) sugar mills in Palm Beach County were made to ascertain feasiblity of use of requested control devices.

4. Cement Batch Operations have potential of emitting dust from several locations. Cement dust is very fine and must be controlled at all transfer points.

Three new batch plants applied for DPC construction permits. After consultation with the project engineers, our comments were forwarded to the Department with the recommendation that permits be issued.

New facilities may be designed in such a manner as to be virtually dust free. However, existing plants frequently do not have sufficient or adequate controls to meet today's air pollution standards. To that end, we have requested and received plans for construction or modification of control equipment on eleven (11) assorted batch cement operations throughout the County. To date we have recommended for approval 6 of these plans. Within the year approval of the remaining plans is expected. Within 15 months modifications for these older

facilities shall be initiated.

5. Applications for permit to construct and/or operate four incinerators were reviewed by this office. These included:

Animal Regulation	- Pathological
Animal Rescue League	- Pathological
Good Samaritan Hospital	- Pathological
Pahokee Incinerator	- City Waste

Recommendations for approval were forthcoming for all but Good Samaritan. Pending receipt of additional technical data from Good Samaritan, approval of this unit is expected.

6. Miscellaneous pollution sources for which our recommendations and/or comments to the Department were made: Consolidated Tank Terminal - storage and transfer of molasses.

Recommended approval.

Glassic Motor Car Company (case pending) Emissions of organic vapors from a fiberglass operation. To be controlled by installation of filter and extended stack.

7. Complex Source - A total of twelve (12) complex source applications were reviewed. Nine (9) were Department of Transportation projects and two (2) were shopping mall projects, included were the Boynton Beach Shopping Mall, and the Boca Del Mar Plaza. The Palm Beach Golf and Ocean Club was also issued a permit during this period.

8. The consistency of West Palm Beach's 1990 Transportation

Plan with the Florida Air Implementation Plan was reviewed during this period and found to be compatible.

VIII
TECHNICAL STUDIES

INTRODUCTION

The ambient air monitoring program in Palm Beach County now consists of the following:

Suspended Particulate (Daily/Monthly) - 12 Sites

- Total Gravimetric
- Benzene Soluble Organics
- Sulfates
- Nitrates

Continuous Gaseous Monitoring - 1 Site

- Carbon Monoxide
- Total Hydrocarbons
- Sulfur Dioxide
- Nitrogen Dioxide
- Ozone

Continuous Gaseous Monitoring - 1 Site

- Sulfur Dioxide

Continuous Meteorlogical Monitoring - 2 Sites

- Wind Speed
- Wind Direction
- Temperature
- Relative Humidity

Continuous Temperature Inversion Monitoring - 1 Site

- Temperature, 3 Levels

Manual Gaseous Monitoring - 2 Sites

- Nitrogen Dioxide

Microscopic Morphology

All data collected is reported monthly to the Department of Pollution Control and to the Environmental Protection Agency (SAROAD) for inclusion in air quality data banks. Gaseous pollutant levels and meteorlogical conditions from one site are relayed by data line to the agency's office data acquisition system. Instantaneous levels of these parameters are available at all times. One, three, eight and twenty-four hour averages are calculated and recorded.

Locations of the monitoring sites are shown in Figure 1. Table 4 gives site identification numbers, addresses, and paramaters measured for all monitoring sites within the County. Table 5 relates measured air quality within Palm Beach County for the year 1974 to the Ambient Air Quality Standards.

PERMANENT MONITORING NETWORK

The permanent monitoring network for suspended particulate and dustfall, sites one thru eight, was established in 1969. The Military Trail intercept line, sites nine thru twelve, was added in 1972. These twelve stations have been maintained as suspended particulate monitoring sites thru the report period. Dustfall collection and analysis was discontinued.

Methododogy: Standard High Volume Samplers and shelters are located at each of the twelve sites. Samples are collected and handled in accordance with Reference Method For the Determination of Suspended Particulates in the Atmosphere

TABLE 4
MONITORING SITE LOCATIONS

SITE NO.	ADDRESS	UTM ZONE 17	MONITORING CAPABILITY
1	West Palm Beach Water Treatment Plant First Street and Tamarind Ave. West Palm Beach, Florida	2955030N 0593232E	Susp. Part. THC, CO, SO_2 NO_2, O_3 Meteorology
2	Tequesta Water Department 357 Tequesta Drive Tequesta, Florida	2982018N 0589963E	Susp. Part.
3	North Palm Beach Water Treatment Plant 603 Anchorage Drive North Palm Beach, Florida	2965817N 0592780E	Susp. Part.
4	Lake Worth Water Treatment Plant 301-303 College Street Lake Worth, Florida	2943537N 0592793E	Susp. Part.
5	Delray Beach Water Treatment Plant 202 N.W. 1st Avenue Delray Beach, Florida	2927488N 0592195E	Susp. Part.
6	Boca Raton Fire Station #1 1151 N. Federal Highway Boca Raton, Florida	2915768N 0591317E	Susp. Part.
7	Royal Palm Beach Golf Course Royal Palm Beach Blvd. Royal Palm Beach, Florida	2951437N 0578767E	Susp. Part.
8	Belle Glade Water Treatment Plant 1016 West Canal Street Belle Glade, Florida	2953082N 0533160E	Susp. Part.
9	Grammercy Park Water Treatment Plant Park Avenue Grammercy Park, Florida	2960537N 0587329E	Susp. Part.
10	Southwest Fire Department 1108 S. Military Trail West Palm Beach, Florida	2949018N 0588207E	Susp. Part.

TABLE 4
MONITORING SITE LOCATIONS (CONT)

11	St. Vincent DePaul Seminary S. Military Trail Boynton Beach, Florida	2932890N 0586927E	Susp. Part.
12	Marymount College S. Military Trail Boca Raton, Florida	2918354N 0587329E	Susp. Part.
13	NO_x SIP Site N8 Florida Atlantic University Boca Raton, Florida	2917000N 0589500E	NO_x
14	NO_x SIP Site N9 Palm Beach Mall Palm Beach Lakes Blvd. West Palm Beach, Florida	2956000N 0590700E	NO_x
15	Division of Forestry Loxahatchee, Florida	Lat. 26° 41' N Long 80° 16' E	Temperature Inversion
	Mobile Van		SO_2, Meteorology

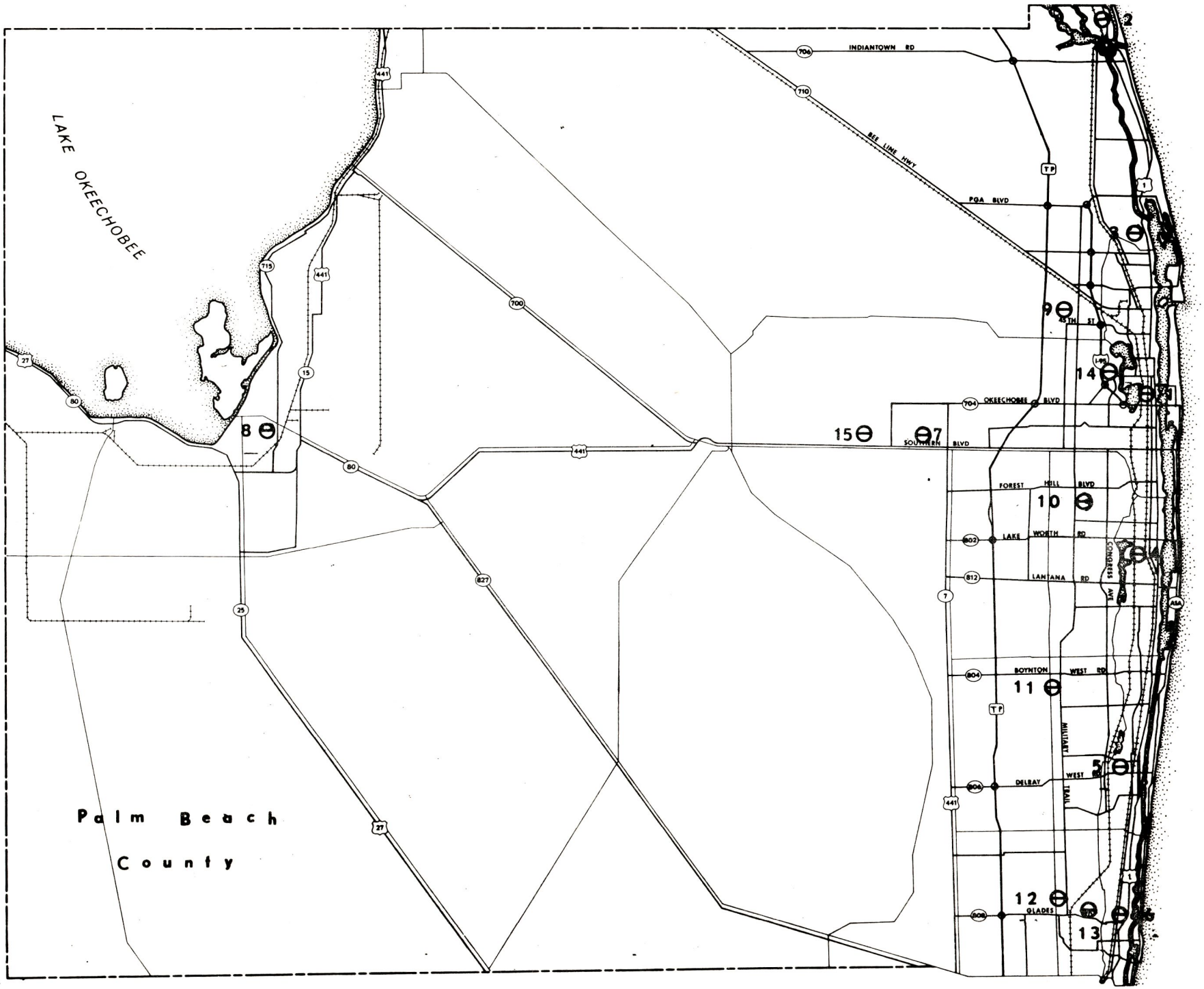

Figure 1 Ambient Air Monitoring Network, 1974

TABLE 5

AMBIENT AIR QUALITY STANDARDS

POLLUTANT (1)	FEDERAL PRIMARY	FEDERAL SECONDARY	STATE	LOCAL (2)	MEASURED LEVELS PALM BEACH COUNTY 1974			
					See TABLE # 6			
					SITE			
					1	8	13	14
Suspended Particulates								
Annual Geo. Mean	75	60	60	50				
Maximum 24 hr. Conc.(3)	260	150	150	180				
Sulfur Oxides					ppm	ppm	ug/m^3	ug/m^3
Annual Arith. Mean	80 (.03 ppm)		60 (.02 ppm)	8.6 (.003 ppm)	(.002)	(.0001)		
Maximum 24 hr. Conc.	365 (.14 ppm)		260 (.1 ppm)	28.6 (.010 ppm)	(.023)	(.004)		
Maximum 3 hr. Conc. (3)		1,300 (.5 ppm)	1,300 (.5 ppm)		(.052)	(.031)		
Maximum 4 hr. Conc.				57.2 (.20 ppm)	(.050)	(.023)		
Maximum 1 hr. Conc.				286 (.100 ppm)	(.075	(.065)		
Carbon Monoxide								
Maximum 8 hr. Conc. (3)	10 (9 ppm)	Same as Fed. Primary	Same as Fed. Primary	9 (8 ppm)	(8.8)			
Maximum 1 hr. Conc.	40 (35 ppm)			14 (12 ppm)	(10.5)			
Photo Chem Oxidants								
Maximum 1 hr. Conc. (3)	160 (.08 ppm)	Same as Fed. Primary	Same as Fed. Primary		(.077)			
Nitrogen Oxides								
Annual Arith. Mean	100 (.05 ppm)	Same as Fed. Primary	Same as Fed. Primary		(.015)		7.24	10.18

TABLE 5 (CONT)
AMBIENT AIR QUALITY STANDARDS

POLLUTANT (1)	FEDERAL PRIMARY	FEDERAL SECONDARY	STATE	LOCAL (2)	MEASURED LEVELS PALM BEACH COUNTY 1974
Hydrocarbons max. 3 hr. Conc. (6-9 am) (3) (4) (5)	160 (.24 ppm)		160 (.24 ppm)		(4.3)

(1) All measurements are in ugm/M^3 except CO which is mg/M^3, or when indicated as ppm.

(2) Dade, Broward and Palm Beach Counties only.

(3) Concentration limits not to be exceeded more than once per year.

(4) Used as guide in devising plans to achieve oxidant standards.

(5) Palm Beach County values not methane corrected.

(High Volume Method), Federal Register, Vol. 36, No. 84 - Friday, April 30, 1971. Sampling time is twenty four hours, running from midnight to midnight for each sampling date. Sites 1 and 8 are sampled on an every fourth day sampling schedule, sites two thru seven and nine thru twelve on a random day, four times per month basis.

Nitrate and Sulfate determinations are made according to proceedures described in Selected Methods for the Measurement of Air Pollutants, U.S. Department of Health, Education and Welfare, May, 1965; Public Health Service Publication No. 9998-AP -11. Benzene soluble organics are determined by procedures described in Analysis of Atmospheric Organics, a Training course manual published by the U.S. Department of Health Education and Welfare.

Tabulated results for suspended particulate for the year 1974 are presented in tables 6, 7 and 8. Figure 2 presents the range of probable logarithmic values for suspended particulate at all twelve stations for the years 1973 and 1974. A historical summation for total suspended particulate measurements from 1969 to the present is presented in tables 9 and 10.

GASEOUS MONITORING

Periodic automated monitoring of sulfur dioxide, nitrogen dioxide and total oxidants at sites 1 thru 8 was begun in June of 1970. Carbon monoxide monitoring was added in January of 1971. Total hydrocarbon monitoring was begun in May of 1972. Instrumentation and methodology for this period have been previously described. The automated gaseous and

TABLE 6
SUSPENDED PARTICULATE MATTER, 1974

SITE NO.	Geometric Mean, ug/m^3 1ST QTR	2ND QTR	3RD QTR	4TH QTR	ANNUAL	GEO STD DEV	%ABOVE OR BELOW ANNUAL STANDARD (50 ug/m3)	24 HR MAX in ug/m^3	NO. OF SAMPLES ABOVE DAILY STANDARD (180 ug/m^3)	TOTAL NO. OF SAMPLES COLLECTED
1	37.8	38.6	39.2	39.7	38.8	1.38	- 22.4	96.4	0	89
2	35.5	29.7	27.6	31.0	30.6	1.36	- 38.8	104.0	0	51
3	33.4	31.9	30.6	33.1	32.2	1.54	- 35.6	132.7	0	53
4	34.8	40.4	36.2	43.8	38.8	1.67	- 22.4	196.8	1	52
5	34.0	33.7	30.2	31.0	32.2	1.53	- 35.6	81.9	0	53
6	46.4	34.9	36.0	36.5	38.4	1.26	- 23.2	92.4	0	50
7	23.9	23.7	20.3	21.5	22.3	1.66	- 55.4	98.3	0	53
8	69.8	54.4	35.2	62.5	54.2	1.57	+ 8.4	210.9	1	81
9	31.9	27.2	25.7	24.7	27.0	1.50	- 46.0	81.2	0	51
10	50.2	39.3	30.9	40.3	39.0	1.54	- 22.0	113.0	0	52
11	30.3	33.8	29.2	24.8	29.4	1.70	- 41.2	134.3	0	51
12	43.1	29.0	22.7	25.8	29.2	1.70	- 41.6	200.7	1	51

TABLE 7
TOTAL SUSPENDED PARTICULATES - 1974

SITE NO.	NUMBER OF SAMPLES J	F	M	A	M	J	J	A	S	O	N	D	TOTAL	CONCENTRATION ug/m^3 MAX	2ND MAX.	MIN	A.MEAN	G.MEAN	Sg.
1	6	6	8	8	7	8	8	7	8	8	7	8	89	96.4	79.4	19.6	40.9	38.8	1.38
2	3	3	5	4	5	5	5	5	4	3	5	4	51	104.0	63.5	19.6	32.4	30.6	1.36
3	4	3	5	4	5	5	5	5	4	4	5	4	53	132.7	96.6	16.1	35.8	32.2	1.54
4	4	3	5	4	5	5	4	5	4	4	5	4	52	196.8	116.6	18.3	45.2	38.8	1.67
5	4	3	5	4	5	6	4	5	4	4	5	4	53	81.9	70.1	13.8	34.8	32.2	1.53
6	3	3	5	4	4	6	3	5	4	4	5	4	50	92.4	87.0	20.9	41.6	38.4	1.26
7	3	4	5	4	5	5	5	5	4	4	5	4	53	98.3	64.9	5.4	25.6	22.3	1.66
8	4	7	8	7	6	7	6	7	6	9	8	6	81	210.9	155.0	22.8	59.8	54.2	1.57
9	4	2	4	4	5	5	4	6	4	4	5	4	51	81.2	71.2	11.3	29.9	27.0	1.50
10	3	4	4	4	5	5	5	5	4	4	5	4	52	113.0	88.1	21.0	43.0	39.0	1.54
11	4	3	3	4	5	6	4	5	4	4	5	4	51	134.3	98.1	13.5	34.4	29.4	1.70
12	3	4	5	4	5	6	4	5	3	3	5	4	51	200.7	95.6	12.8	34.9	29.2	1.70

TABLE 8
MONTHLY AVERAGE CONTENT - SUSPENDED PARTICULATE - 1974

SITE NO.	ITEMS MEASURED	ARITHMETIC AVERAGE ug/m^3 J	F	M	A	M	J	J	A	S	O	N	D	ANNUAL
1	Total Suspended Particulates	33.2	39.9	42.7	43.3	40.8	37.4	36.3	49.9	41.0	43.2	45.8	37.0	40.9
	Organics, Benzene Solubles	3.11	1.44	2.72	2.05	3.29	2.82	2.89	2.06	1.72	1.96	1.30	3.52	2.41
	Sulfates	2.19	4.32	2.30	2.14	2.47	1.27	3.38	1.59	1.37	5.08	3.55	2.65	2.69
	Nitrates	0.70	1.04	0.35	1.53	1.51	1.33	0.57	0.72	0.26	0.36	1.25	1.42	0.92
2	Total Suspended Particulates	32.7	34.4	39.5	35.2	36.6	23.4	27.3	32.7	24.3	57.6	27.5	26.0	32.4
	Organics, Benzene Solubles	2.71	2.52	1.64	4.06	4.96	1.60	1.93	3.26	1.36	2.02	1.51	1.29	2.40
	Sulfates	1.99	7.95	3.11	4.16	3.10	2.64	7.07	1.31	1.99	4.35	4.66	2.00	3.69
	Nitrates	0.66	1.72	0.41	2.08	2.07	0.88	0.85	0.72	0.31	0.82	1.07	0.94	1.04
3	Total Suspended Particulates	24.3	39.8	52.6	43.2	34.1	27.7	29.7	43.5	22.2	51.0	25.9	37.3	35.8
	Organics, Benzene Solubles	2.29	1.67	2.21	1.28	6.96	2.50	1.98	1.89	1.44	1.85	0.95	1.96	2.25
	Sulfates	2.33	6.15	2.47	3.27	3.07	1.75	7.37	1.27	1.64	4.18	3.30	4.16	3.41
	Nitrates	1.00	1.29	0.33	0.97	1.74	1.03	1.51	0.49	0.25	0.31	0.84	1.26	0.92

TABLE 8 (CONT)
MONTHLY AVERAGE CONTENT - SUSPENDED PARTICULATE - 1974

SITE NO.	ITEMS MEASURED	ARITHMETIC AVERAGE ug/m^3 J	F	M	A	M	J	J	A	S	O	N	D	ANNUAL
4	Total Suspended Particulates	24.5	42.3	48.9	87.8	31.5	42.1	31.7	47.3	33.5	38.0	52.0	63.0	45.2
	Organics, Benzene Soluble	3.20	1.35	2.94	2.05	2.44	1.25	3.16	2.12	1.93	1.31	1.66	3.26	2.22
	Sulfates	1.57	1.57	3.33	5.93	1.96	2.45	2.39	1.33	1.02	2.38	4.10	3.67	2.64
	Nitrates	0.78	0.80	0.45	1.65	1.30	1.00	0.96	0.82	0.25	0.82	1.02	1.48	0.94
5	Total Suspended Particulates	28.7	36.3	43.5	41.8	34.1	35.8	28.5	46.7	20.3	37.3	32.6	27.8	34.8
	Organics, Benzene Soluble	2.98	1.76	3.17	4.24	2.95	4.36	2.82	3.48	0.62	1.80	1.14	1.88	2.60
	Sulfates	1.33	3.87	4.14	6.14	2.26	2.90	3.68	1.58	1.09	3.25	3.12	2.76	3.01
	Nitrates	1.09	0.69	0.48	1.42	1.37	1.12	0.83	0.65	0.22	0.19	0.70	0.69	0.79
6	Total Suspended Particulates	22.8	60.6	64.7	52.0	37.8	32.2	38.7	41.0	31.0	46.5	35.5	36.3	41.6
	Organics, Benzene Soluble	1.31	4.12	4.54	2.42	1.97	1.94	2.17	1.87	0.47	1.45	1.34	1.68	2.11
	Sulfates	2.72	8.02	5.58	4.45	1.91	2.16	3.49	1.59	1.32	1.22	2.77	3.04	3.19
	Nitrates	0.68	3.00	0.54	1.14	1.36	0.63	0.62	0.68	0.33	0.38	0.99	0.70	0.92

TABLE 8 (CONT)
MONTHLY AVERAGE CONTENT - SUSPENDED PARTICULATE - 1974

SITE NO.	ITEMS MEASURED	ARITHMETIC AVERAGES ug/m^3 J	F	M	A	M	J	J	A	S	O	N	D	ANNUAL
7	Total Suspended Particulates	13.5	24.8	36.5	37.6	35.4	18.7	20.6	29.6	15.4	25.2	21.5	23.3	25.6
	Organics, Benzene Solubles	2.35	0.81	2.29	4.50	8.94	1.69	1.57	2.04	0.62	1.63	1.35	3.30	2.59
	Sulfates	2.16	5.89	2.23	4.31	2.54	1.53	3.31	0.41	1.87	1.92	4.79	2.56	2.79
	Nitrates	0.62	1.35	0.26	1.72	1.37	0.62	0.93	0.51	0.35	0.36	1.37	1.01	0.87
8	Total Suspended Particulates	65.7	81.4	72.2	73.9	68.1	37.4	32.0	40.2	36.2	52.2	89.7	61.9	59.8
	Organics, Benzene Solubles	2.45	2.84	4.26	4.20	4.69	3.67	2.49	2.44	1.64	1.72	3.45	4.23	3.17
	Sulfates	2.14	5.32	5.29	4.83	3.33	2.39	5.00	1.11	1.68	5.21	8.03	3.86	4.02
	Nitrates	1.39	1.25	0.36	1.63	1.79	0.85	0.75	0.56	0.24	0.10	1.52	1.32	0.98
9	Total Suspended Particulates	23.3	39.4	43.3	40.3	32.4	22.6	31.7	29.8	19.7	34.5	22.5	27.4	29.9
	Organics, Benzene Solubles	2.56	2.51	2.14	1.40	4.62	3.14	1.99	1.86	1.02	1.21	1.23	2.15	2.15
	Sulfates	1.95	5.49	3.58	3.22	1.87	1.31	5.47	1.77	0.94	2.97	2.67	2.30	2.80
	Nitrates	1.04	2.20	0.22	1.68	1.77	1.03	0.50	0.73	0.18	0.43	1.03	0.51	0.94

TABLE 8 (CONT)
MONTHLY AVERAGE CONTENT - SUSPENDED PARTICULATE - 1974

SITE NO.	ITEMS MEASURED	ARITHMETIC AVERAGE ug/m^3												
		J	F	M	A	M	J	J	A	S	O	N	D	ANNUAL
10	Total Suspended Particulates	25.2	36.4	57.2	40.4	47.9	30.6	35.6	36.0	23.7	38.3	24.2	24.6	34.4
	Organics, Benzene Solubles	2.68	2.21	3.31	2.49	6.09	1.70	2.70	1.58	1.97	1.32	1.08	2.00	2.43
	Sulfates	2.92	7.21	1.95	6.80	3.09	1.51	2.08	1.31	0.80	2.07	1.80	2.24	2.82
	Nitrates	0.73	0.67	0.13	1.21	1.24	0.80	0.78	0.75	0.27	0.31	1.41	0.85	0.76
11	Total Suspended Particulates	35.0	65.7	59.7	52.8	46.0	31.8	32.5	35.5	26.4	50.7	45.3	39.6	43.0
	Organics, Benzene Solubles	4.16	3.56	2.70	3.29	1.77	2.60	2.66	1.74	3.48	2.36	2.45	7.13	3.16
	Sulfates	2.17	2.94	2.98	6.54	3.77	1.96	3.90	1.38	1.70	2.06	0.67	2.42	2.71
	Nitrates	1.01	0.76	0.46	1.26	1.81	0.71	0.57	0.65	0.46	0.42	0.93	0.75	0.82
12	Total Suspended Particulates	23.6	47.2	79.9	29.5	37.5	33.3	25.2	28.0	16.3	33.0	23.8	26.4	34.9
	Organics Benzene Solubles	6.15	1.21	4.17	1.30	7.05	1.62	3.72	1.96	0.99	1.40	1.14	1.62	2.69
	Sulfates	2.62	4.42	4.12	4.32	3.72	2.26	2.47	1.28	1.36	2.25	4.27	3.64	3.06
	Nitrates	1.17	0.51	0.42	0.89	1.41	1.01	0.52	0.79	0.19	0.45	0.43	0.51	0.69

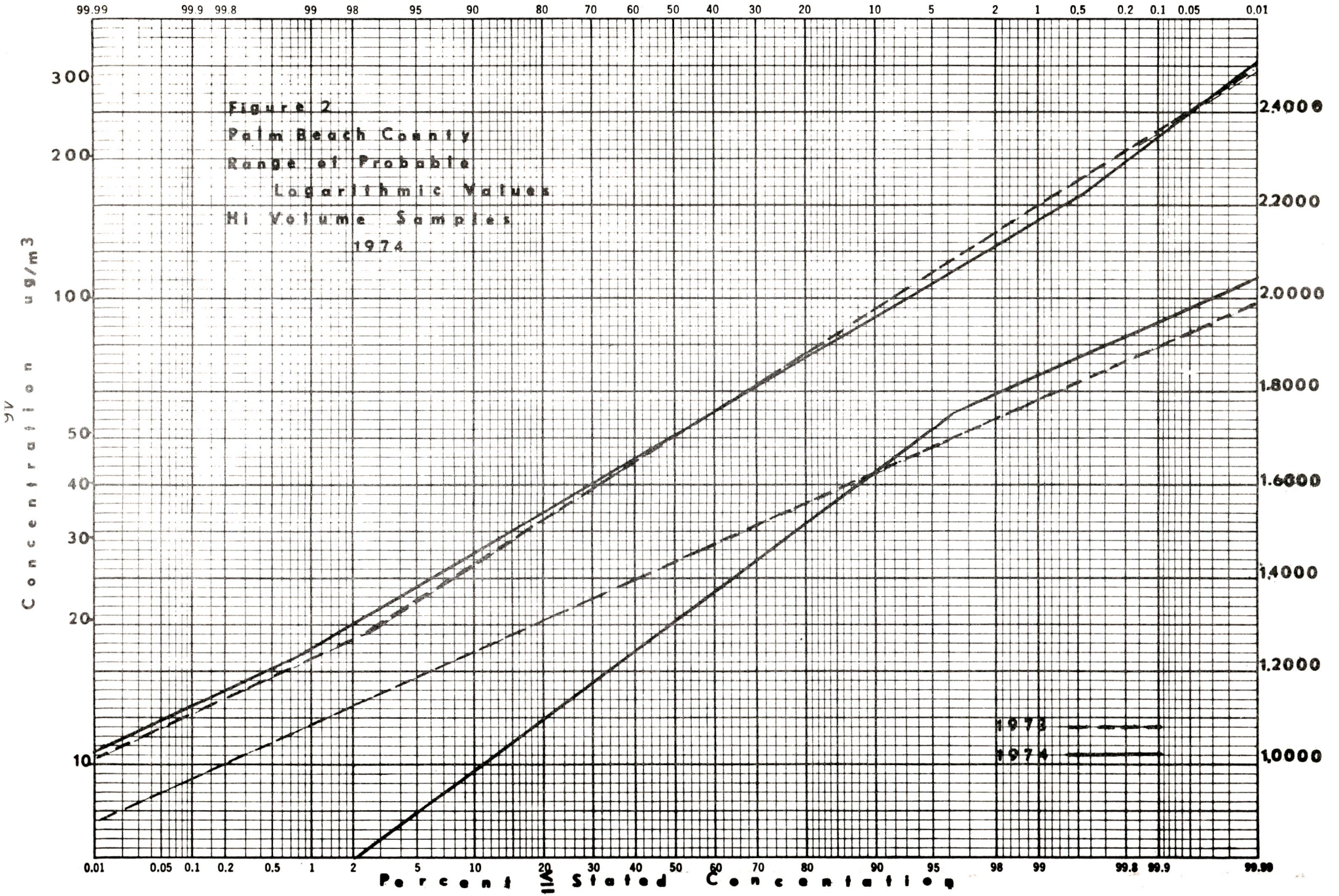
Figure 2
Palm Beach County
Range of Probable
Logarithmic Values
Hi Volume Samples
1974
Concentration ug/m3
Log Concentration
Percent Will Stated Concentation
1973
1974
99.99
99.9
99.8
99
98
95
90
80
70
60
50
40
30
20
10
5
2
1
0.5
0.2
0.1
0.05
0.01
300
200
100
50
40
30
20
10
2.4000
2.2000
2.0000
1.8000
1.6000
1.4000
1.2000
1.0000

TABLE 9

TOTAL SUSPENDED PARTICULATE ug/m^3

Site No.	Parameter	Year 1969	1970	1971	1972	1973	1974
1	Maximum	109.3	115.7	121.1	133.6	101.9	96.4
	Minimum	9.6	13.9	15.2	15.2	10.8	19.6
	Arithmetic Mean	48.7	40.9	58.7	49.9	40.5	40.9
	Geometric Mean	43.9	39.5	53.4	45.9	38.0	38.8
	Geometric Std. Deviation	1.56	1.42	1.19	1.49	1.49	1.38
2	Maximum	71.2	74.3	122.3	112.3	85.4	104.0
	Minimum	7.3	13.3	10.7	12.2	5.3	19.6
	Arithmetic Mean	26.9	30.4	34.6	33.0	33.6	32.4
	Geometric Mean	24.6	28.3	30.8	30.3	31.4	30.6
	Geometric Std. Deviation	1.51	1.45	1.61	1.48	1.49	1.36
3	Maximum	71.8	82.3	167.5	94.8	133.2	132.7
	Minimum	7.7	1.3	0.4	12.8	16.6	16.1
	Arithmetic Mean	32.2	31.7	40.6	37.0	38.2	35.8
	Geometric Mean	29.5	28.4	30.7	33.7	35.3	32.2
	Geometric Std. Deviation	1.63	1.76	2.93	1.49	1.47	1.54
4	Maximum	351.9	224.8	95.6	89.8	85.6	196.8
	Minimum	7.3	8.0	10.2	12.9	13.3	18.3
	Arithmetic Mean	32.9	30.9	37.2	34.8	37.7	45.2
	Geometric Mean	26.4	28.2	31.7	32.3	35.3	38.8
	Geometric Std. Deviation	1.78	1.47	1.85	1.49	1.39	1.67
5	Maximum	164.9	76.7	142.4	108.0	92.9	81.9
	Minimum	13.3	8.3	12.2	15.9	10.9	13.8
	Arithmetic Mean	40.1	36.2	36.4	38.5	40.0	34.8
	Geometric Mean	38.8	33.6	32.0	35.4	37.6	32.2
	Geometric Std. Deviation	1.47	1.49	1.64	1.49	1.46	1.53

TABLE 9 (CONT)
TOTAL SUSPENDED PARTICULATE ug/m^3

Site No.	Parameter	YEAR 1969	1970	1971	1972	1973	1974
6	Maximum	83.1	80.1	237.9	275.3	106.5	92.4
	Minimum	9.5	9.6	13.3	17.0	13.6	20.9
	Arithmetic Mean	36.4	33.5	49.1	44.9	43.1	41.6
	Geometric Mean	32.9	31.0	41.1	39.9	40.2	38.4
	Geometric Std. Deviation	1.60	1.48	2.09	1.56	1.46	1.26
7	Maximum	52.5	71.7	131.5	102.0	65.5	98.3
	Minimum	7.2	2.1	1.6	7.0	9.1	5.4
	Arithmetic Mean	23.6	25.8	30.7	31.8	28.1	25.6
	Geometric Mean	21.5	23.3	24.4	28.3	26.2	22.3
	Geometric Std. Deviation	1.57	1.59	2.13	1.37	1.45	1.66
8	Maximum	175.7	273.9	222.7	173.3	151.0	210.9
	Minimum	12.7	14.5	12.6	19.8	20.3	22.8
	Arithmentic Mean	53.8	54.6	61.4	58.6	59.8	59.8
	Geometric Mean	46.0	47.1	53.1	52.3	54.0	54.2
	Geometric Std. Deviation	1.76	1.70	1.64	1.60	1.61	1.57
9	Maximum				74.5	145.3	81.2
	Minimum				13.3	11.7	11.3
	Arithmetic Mean				31.2	33.2	29.9
	Geometric Mean				28.7	30.7	27.0
	Geometric Std. Deviation				1.42	1.45	1.50
10	Maximum				94.8	109.0	113.0
	Minimum				18.3	19.0	21.0
	Arithmetic Mean				44.4	45.3	43.0
	Geometric Mean				41.6	42.5	39.0
	Geometric Std. Deviation				1.43	1.43	1.54

TABLE 9 (CONT)
TOTAL SUSPENDED PARTICULATE ug/m^3

Site No.	Parameter	YEAR 1969	1970	1971	1972	1973	1974
11	Maximum				69.9	77.8	134.3
	Minimum				11.9	11.5	13.5
	Arithmetic Mean				32.1	30.8	34.4
	Geometric Mean				29.2	28.9	29.4
	Geometric Std. Deviation				1.51	1.53	1.70
12	Maximum				68.1	79.6	200.7
	Minimum				11.2	11.0	12.8
	Arithmetic Mean				29.6	31.6	34.9
	Geometric Mean				26.9	29.6	29.2
	Geometric Std. Deviation				1.54	1.43	1.70

TABLE 10
ANNUAL AVERAGE CONTENT - SUSPENDED PARTICULATE
ARITHMETIC AVERAGES ug/m^3

Site No.	Parameter	YEAR 1969	1970	1971	1972	1973	1974
1	Total Suspended Particulate	48.7	40.9	58.7	40.6	40.5	40.9
	Organics, Benzene Soluble	3.3	3.8	4.7	2.4	2.0	2.4
	Sulfates	4.1	3.2	3.6	3.7	2.9	2.7
	Nitrates	0.8	0.7	1.2	0.9	1.0	0.9
2	Total Suspended Particulate	26.9	30.4	34.6	33.0	33.6	32.4
	Organics, Benzene Soluble	1.6	1.6	4.0	1.0	1.3	2.4
	Sulfates	3.6	4.2	3.2	3.5	3.0	3.7
	Nitrates	0.6	0.6	0.8	0.8	1.0	1.0
3	Total Suspended Particulate	32.2	31.7	40.6	37.0	38.2	35.8
	Organics, Benzene Soluble	3.9	4.4	4.8	1.2	1.8	2.2
	Sulfates	2.4	3.4	3.2	3.1	3.5	3.4
	Nitrates	0.7	0.7	0.9	0.8	1.1	0.9
4	Total Suspended Particulate	32.9	30.9	37.2	34.8	37.7	45.2
	Organics, Benzene Soluble	1.5	1.7	3.3	1.2	1.5	2.2
	Sulfates	3.3	3.2	3.1	3.6	3.0	2.6
	Nitrates	0.7	0.8	1.0	0.7	1.2	0.9
5	Total Suspended Particulate	40.1	36.2	36.4	38.5	40.0	34.8
	Organics, Benzene Soluble	2.8	2.9	3.5	1.0	1.5	2.6
	Sulfates	3.9	4.1	2.8	3.5	3.1	3.0
	Nitrates	0.8	0.8	0.9	0.8	1.1	0.8
6	Total Suspended Particulate	36.4	33.5	49.1	44.9	43.1	41.6
	Organics, Benzene Soluble	1.6	2.4	3.2	1.1	1.6	2.1
	Sulfates	3.9	3.2	2.9	3.0	3.6	3.2
	Nitrates	0.7	0.8	0.9	0.8	1.3	0.9

TABLE 10 (CONT)
ANNUAL AVERAGE CONTENT - SUSPENDED PARTICULATE
ARITHMETIC AVERAGES ug/m^3

Site No.	Parameter	YEAR 1969	1970	1971	1972	1973	1974
7	Total Suspended Particulate	23.6	25.8	30.7	31.8	28.1	25.6
	Organics, Benzene Soluble	1.6	2.3	4.2	0.8	1.6	2.6
	Sulfates	3.4	3.6	2.2	3.0	2.7	2.8
	Nitrates	0.7	0.8	0.9	0.8	1.1	0.9
8	Total Suspended Particulate	53.8	54.6	61.4	58.6	59.8	59.8
	Orgaincs, Benzene Soluble	2.8	3.6	5.6	2.0	2.5	3.2
	Sulfates	4.2	4.1	3.3	3.4	4.0	4.0
	Nitrates	0.8	1.0	1.2	1.1	1.4	1.0
9	Total Suspended Particulate				31.2	33.2	29.9
	Organics, Benzene Soluble				1.3	1.3	2.2
	Sulfates				2.8	2.9	2.8
	Nitrates				0.8	1.1	0.9
10	Total Suspended Particulate				44.4	45.3	43.0
	Organics, Benzene Soluble				1.2	2.8	3.2
	Sulfates				2.5	3.1	2.7
	Nitrates				0.8	1.0	0.8
11	Total Suspended Particulate				32.1	30.8	34.4
	Organics, Benzene Soluble				2.1	1.8	2.4
	Sulfates				2.9	2.6	2.8
	Nitrates				0.8	1.1	0.8
12	Total Suspended Particulate				29.6	31.6	34.9
	Organics, Benzene Soluble				1.4	1.3	2.7
	Sulfates				2.7	3.6	3.1
	Nitrates				0.8	1.0	0.7

meteorlogical monitoring equipment was installed in the permanent monitoring station (Site 1) in November of 1972. Original Technicon Monitoring equipment for nitrogen dioxide, sulfur dioxide and total oxidents was replaced during the third quarter of 1973. The monitoring of total oxidants was discontinued and replaced by the monitoring of ozone. A special study of sulfur dioxide levels and meteorlogical parameters was begun in Belle Glade (Site 8) in September of 1972. Two manual stations for the measurement of nitrogen dioxide were established in November of 1973. These sites are maintained as part of the State Air Quality Surveillance Program as required by the State Air Implementation Plan.

Maximum ambient air concentrations for gaseous sampling in Palm Beach County for the period 1970-1974 are presented in Table 11.

NITROGEN DIOXIDE

Continuous automatic monitoring for this pollutant is carried on at site 1. Instrumentation is a MEC Model 1200 NO-NO_X (McMillan Electronics Corporation) chemiluminescence analyzer. Table 12 presents monthly and annual sampling time, arithmetic means and twenty four hour maximum concentrations. Instrument failure accounted for loss of sampling data for fifty-nine percent of the report period. Values recorded during the periods of operation indicate levels of this pollutant well below those specified by the Ambient Air Standard. Table 13 includes quarterly and annual one, eight and twenty four hour maximums, annual

TABLE 11

GASEOUS SAMPLING

MAXIMUM AMBIENT AIR CONCENTRATIONS, PPM.

SITE NO.	SAMPLING DATES	SULFUR DIOXIDE 1 HOUR	SULFUR DIOXIDE 4 HOUR	SULFUR DIOXIDE 24 HOUR	TOTAL OXIDANTS 1 HOUR	TOTAL OXIDANTS 8 HOUR	O_3 1 HOUR	O_3 8 HOUR
1	7/17-7/31/70	0.094	0.032	0.007	0.114	0.073		
	4/12-4/27/71	0.044	>0.029	>0.006	>0.188	>0.130		
	7/16-7/30/71	0.035	0.009	0.002	0.032	0.026		
	11/14-12/31/72	0.023	0.017	0.003	>0.187	>0.040		
	1/1-11/14/73	0.042	0.026	0.004				
	11/14-12/31/73	0.015	0.006	0.001				
	1/1-11/1/73				0.155	0.063		
	9/6-12/31/73						>0.100	>0.071
	1/1-12/31/74	0.075	0.050	0.023			0.077	0.055
2	6/16-7/2/70	0.035	0.025	0.010	0.104	0.093		
	5/11-5/25/71	0.191	0.120	0.028	0.010	0.0004		
	8/13-8/27/71	0.033	0.011	0.003	0.016	0.018		
3	7/2-7/17/70	0.196	0.097	0.028	0.176	0.086		
	4/27-5/11/71	>0.500	>0.293	0.060	0.111	0.055		
	7/30-8/13/71	0.064	0.031	0.005	0.007	0.001		
	5/18-6/30/72	0.053	0.024	0.006	0.116	0.071		
4	7/31-8/14/70	0.031	0.024	0.010	0.129	0.089		
	3/26-4/12/71	0.044	>0.027	0.012	0.110	0.106		
	9/23-10/4/71	0.080	0.025	0.006	0.056	0.048		
	11/10-11/19/71	0.000	0.000	0.000	0.078	0.073		
5	9/4-9/18/70	0.069	0.021	0.003	0.092	0.066		
	3/12-3/26/71	0.060	0.026	0.005	0.013	0.086		
	10/19-11/1/71	0.006	0.002	0.0003	0.136	0.101		

TABLE 11 (CONT)
GASEOUS SAMPLING
MAXIMUM AMBIENT AIR CONCENTRATIONS, PPM.

SITE NO.	SAMPLING DATES	SULFUR DIOXIDE 1 HOUR	SULFUR DIOXIDE 4 HOUR	SULFUR DIOXIDE 24 HOUR	TOTAL OXIDANTS 1 HOUR	TOTAL OXIDANTS 8 HOUR	O_3 1 HOUR	O_3 8 HOUR
6	8/21-9/4/70	0.076	0.044	0.013	0.048	0.037		
	1/27-2/12/71	0.132	0.087	0.017	0.110	0.095		
	12/29-1/12/72	0.068	0.034	0.006	0.000	0.000		
	7/5-8/1/72	0.015	0.012	0.003	0.050	0.027		
7	9/28-10/12/70	0.106	0.036	0.006	0.076	0.068		
	2/26-3/12/71	0.026	>0.007	>0.003	0.110	0.093		
	11/19-12/10/71	0.015	0.005	0.001	0.038	0.016		
8	10/12-10/26/70	0.000	0.000	0.000	0.078	0.061		
	2/12-2/26/71	>0.288	>0.122	>0.030	0.103	0.076		
	2/10-12/29/71	>0.267	>0.187	>0.039	0.012	0.006		
	9/21/72-5/1/73	0.044	0.021	0.007				
	12/1/72-5/18/73	0.176	0.086	0.044				
	12/18-12/31/73	0.153	0.104	0.025				
	1/1-9/27/74	0.065	0.023	0.004				

TABLE 11 (Cont.)
MAXIMUM AMBIENT AIR CONCENTRATION, PPM.

SITE NO.	SAMPLING DATES	NO_2 1 HOUR	NO_2 8 HOUR	NO_2 AR./MEAN	CO 1 HOUR	CO 8 HOUR	HC 1 HOUR	HC 8 HOUR
1	7/17-7/31/70	0.097	0.068	0.016				
	4/12-4/27/71	0.147	0.079	0.026				
	7/16-7/30/71	0.067	0.056	0.018	3.6	3.1		
	11/14-12/31/72	0.092	0.079	0.020	7.0	3.7	6.5	3.2
	1/1-11/15/73	0.060	0.047	0.007				
	1/1-12/31/73				8.9	6.3	5.5	3.3
	1/1-12/31/74	0.080	0.052	0.015	10.5	8.8	5.8	4.4
2	6/16-7/2/70	0.044	0.032	0.010				
	5/11-5/25/71	0.054	0.040	0.013	2.2	0.3		
	8/12-8/27/71	0.073	0.060	0.013	0.0	0.0		
3	7/2-7/17/70	0.084	0.060	0.010				
	4/27-5/11/71	0.096	0.066	0.017				
	7/30-8/13/71	0.083	0.069	0.018	3.2	0.9		
	5/18-6/30/72	0.088	0.059	0.010	0.0	0.0	3.2	2.2
4	7/31-8/14/70	0.097	0.068	0.016				
	3/26-4/12/71	0.118	0.107	0.018	2.1	0.3		
	9/23-10/4/71	0.059	0.041	0.018	0.0	0.0		
	11/10-11/19/71	0.124	0.101	0.020	0.0	0.0		
5	9/4-9/18/70	0.055	0.051	0.013				
	3/12-3/26/71	0.146	0.113	0.018	2.1	0.4		
	10/19-11/1/71	0.117	0.093	0.029				

TABLE 11 (Cont.)
MAXIMUM AMBIENT AIR CONCENTRATION, PPM.

SITE NO.	SAMPLING DATES	NO_2 1 HOUR	NO_2 8 HOUR	NO_2 AR./MEAN	CO 1 HOUR	CO 8 HOUR	HC 1 HOUR	HC 8 HOUR
6	8/21-9/4/70	0.064	0.048	0.015				
	1/27-2/12/71	>0.200	>0.187	0.047	9.6	4.2		
	12/29-1/12/71	0.079	0.069	0.022	2.6	0.4		
	7/5-8/1/72	0.065	0.055	0.011				
7	9/28-10/12/71	0.031	0.018	0.007				
	2/26-3/12/71	0.106	0.081	0.016	0.8	0.1		
	11/9-12/10/71	0.074	0.055	0.019	2.2	2.0		
8	10/12-10/26/70	0.118	0.067	0.017				
	2/12-2/26/71	0.152	0.091	0.022	5.2	3.0		
	12/10-12/29/71	0.076	0.048	0.024	0.0	0.0		
13	11/14-12/31/73			0.003				
	1/1-12/31/74			0.004				
14	11/14-12/31/73			0.004				
	1/1-12/31/74			0.005				

TABLE 12
NITROGEN DIOXIDE DATA
SITE NUMBER 1
1974

MONTH	HOURS	ARITH. (a) AVG., ppm	MAX. 24 HR. AVG., ppm
J	0		
F	0		
M	0		
A	0		
M	499	0.016	0.042
J	712	0.015	0.022
J	338	0.013	0.021
A	0		
S	59	0.010	0.010
O	709	0.014	0.022
N	701	0.016	0.032
D	596	0.015	0.021
ANNUAL	3614	0.015	0.042

(a) Standard is 0.05 ppm, annual arithmetic mean.

TABLE 13
AMBIENT AIR - NITROGEN DIOXIDE, PPM
SITE NUMBER 1
1974

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Annual	%	Cum %
1 Hr. Maximum		0.080	0.034	0.057	0.080		
8 Hr. Maximum		0.052	0.026	0.044	0.052		
24 Hr. Maximum		0.042	0.021	0.032	0.042		
Arith. Mean					0.015		
Geo. Mean					0.013		
Concentration Range			Hours				
<.010		390	150	441	981	27.14	27.14
.010- .019		526	185	1150	1861	51.49	78.64
.020- .029		179	55	328	562	15.55	94.19
.030- .039		71	6	62	139	3.85	98.04
.040- .049		28	1	19	48	1.33	99.36
.050- .059		11		6	17	0.47	99.83
.060- .069		3			3	0.08	99.92
.070- .079		2			2	0.06	99.97
.080- .089		1			1	0.03	100.00
Total		1211	397	2006	3614		
Total Downtime	2160	973	1811	202	5146		
Total Time at Site	2160	2184	2208	2208	8760		

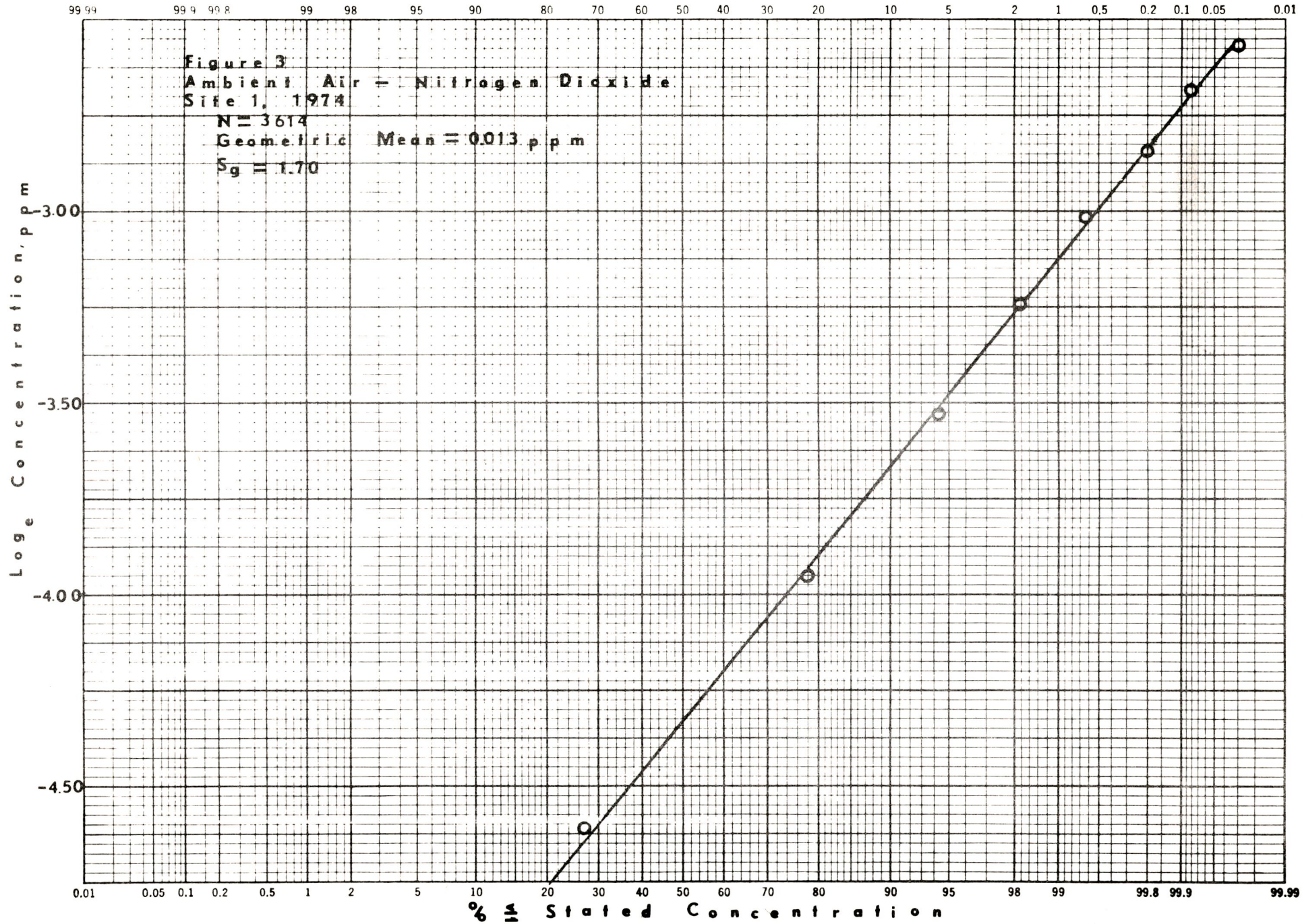
Figure 3
Ambient Air - Nitrogen Dioxide
Site 1, 1974
N = 3614
Geometric Mean = 0.013 ppm
S_g = 1.70
Log$_e$ Concentration, ppm
-3.00
-3.50
-4.00
-4.50
99.99 99.9 99.8 99 98 95 90 80 70 60 50 40 30 20 10 5 2 1 0.5 0.2 0.1 0.05 0.01
0.01 0.05 0.1 0.2 0.5 1 2 5 10 20 30 40 50 60 70 80 90 95 98 99 99.8 99.9 99.99
% ≤ Stated Concentration

arithmetic and geometric means and the frequency distribution of ranges of pollutant levels recorded. Figure 3 presents the relationship of the natural log concentration values of these pollutant levels to time.

Manual samplers for this pollutant are operated at sites 13 and 14. Sampling procedure is as described in the Federal Register, Volume 38, No. 110, Friday June 8, 1973. Frequency of sampling is every sixth day. Table 14 presents number of samples, arithmetic averages and twenty four hour maximums for each of the sites. Values recorded place the recorded concentrations of this pollutant well below those of the Ambient Air Quality Standard. Tables 15 and 16 give monthly and annual sampling frequency, maximum recorded values, arithmetic and geometric means for each station.

Carbon Monoxide : This pollutant is monitored continuously at Site 1. Instrumentation is a Mine Safty Appliance, Model 200 nondispersive infrared spectrophotometric automatic analyzer. Data represents eighty-two percent of the possible time during the report period.

Table 17 presents a monthly record of sampling hours, one and eight hour maximums, and relates concentration maximums to the Southeast Florida Ambient Air Quality Standard. There were no recorded values in excess of the one hour standard, however the eight hour standard was exceeded one time during the month of April.

Table 18 presents quarterly, one and eight hour maximum values and frequency distribution of all recorded pollutant

TABLE 14
MANUAL SAMPLING, 1974

NITROGEN DIOXIDE, ug/m^3

SITE	NO. OF SAMPLES	ARITH. AVG.(a)	24 HR. MAX.
13	46	7.24	20.63
14	48	10.18	26.30

(a) Standard is 100 ug/m^3 Annual Arithmetric Average.

TABLE 15
NO_2 BUBBLER - N_8
SITE NUMBER 13
1974

Concentrations = ug/m^3

	J	F	M	A	M	J	J	A	S	O	N	D	Annual
Number of Samples	2	2	2	3	4	5	4	5	4	5	4	6	46
Maximum	10.60	7.10	4.20	15.41	19.61	20.63	14.53	10.37	7.05	5.95	5.98	11.10	20.63
Second Maximum	0.80	2.30	0.00	2.62	7.97	19.42	12.00	6.82	5.91	4.46	4.64	10.97	19.61
A. Mean (a)	5.70	4.70	2.10	6.51	8.59	16.99	10.02	5.43	5.24	3.98	3.98	7.57	7.24
Stand Dev.													5.08
G. Mean													5.33
Sg.													2.52

(a) Standard is 100 ug/m^3 annual arithmatic mean.

TABLE 16
NO_2 BUBBLER - N_9
SITE NUMBER 14
1974

Concentrations = ug/m^3

	J	F	M	A	M	J	J	A	S	O	N	D	ANNUAL
Number of Samples	2	2	2	4	5	5	5	4	5	5	5	4	48
Maximum	11.60	26.30	1.50	11.96	16.50	20.60	24.80	16.72	19.90	11.41	11.83	24.78	26.30
Second Maximum	10.70	5.60	7.10	8.91	15.82	18.48	21.76	8.06	15.84	5.84	5.53	16.18	24.80
A. Mean (a)	11.15	15.95	4.30	7.09	8.91	14.59	13.79	8.21	10.45	6.26	5.99	16.17	10.18
Stand. Dev.													6.72
G. Mean													7.92
Sg.													2.20

(a) Standard is 100 ug/m^3 annual arithmatic mean

TABLE 17
CARBON MONOXIDE DATA
SITE NUMBER 1
1974

MONTH	HOURS	GEO. MEAN ppm	1 HR. MAX. ppm	NO. OF HOURS 1 HR. STANDARD (12 ppm) EXCEEDED	8 HR. MAX. ppm	NO. OF TIMES 8 HR. STANDARD (8 ppm) EXCEEDED
J	702		7.5	0	3.2	0
F	613		5.4	0	3.4	0
M	730		10.0	0	3.2	0
A	662		10.5	0	8.8	1
M	442		3.7	0	3.4	0
J	716		6.8	0	3.3	0
J	705		3.7	0	3.6	0
A	650		4.2	0	2.9	0
S	637		4.5	0	2.9	0
O	725		5.2	0	2.2	0
N	262		7.7	0	6.6	0
D	332		7.0	0	4.6	0
ANNUAL	7179	0.84	10.5	0	8.8	1

TABLE 18
AMBIENT AIR, CARBON MONOXIDE, PPM
SITE NUMBER 1
1974

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Annual	%	Cum %
1 Hr. Maximum	10.0	10.5	4.5	7.7	10.5		
8 Hr. Maximum	3.2	8.8	3.6	6.6	8.8		
Concentration Range			Hours				
≤ 2.0	1776	1649	1767	1114	6306	87.84	87.84
2.0 - 2.4	118	81	118	46	363	5.06	92.90
2.5 - 2.9	70	36	71	36	213	2.97	95.86
3.0 - 3.9	60	40	32	22	154	2.15	98.01
4.0 - 4.9	11	6	4	16	37	0.52	98.52
5.0 - 5.9	5	2		45	52	0.72	99.25
6.0 - 6.9	3	1		33	37	0.52	99.76
7.0 - 7.9	1	1		7	9	0.13	99.89
8.0 - 8.9		2			2	0.03	99.92
9.0 - 9.9		4			4	0.06	99.97
10.0 -10.9	1	1			2	0.03	100.00
Total	2045	1823	1992	1319	7179		
Total Downtime	115	361	216	889	1581		
Total Time at Site	2160	2184	2208	2208	8760		

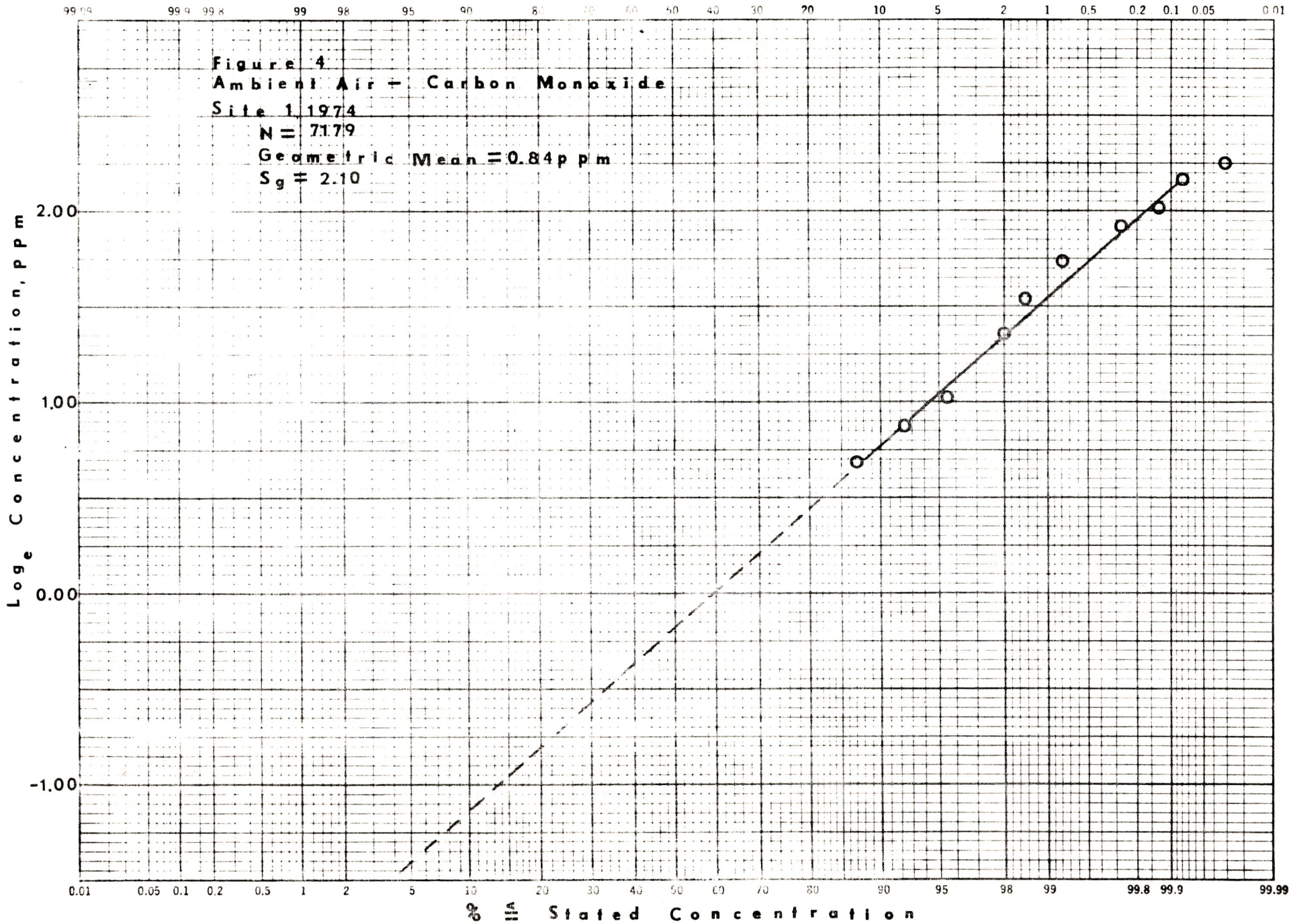
Figure 4
Ambient Air – Carbon Monoxide
Site 1, 1974
N = 7179
Geometric Mean = 0.84 ppm
S_g = 2.10
Log$_e$ Concentration, ppm
2.00
1.00
0.00
-1.00
99.99 99.9 99.8 99 98 95 90 80 70 60 50 40 30 20 10 5 2 1 0.5 0.2 0.1 0.05 0.01
0.01 0.05 0.1 0.2 0.5 1 2 5 10 20 30 40 50 60 70 80 90 95 98 99 99.8 99.9 99.99
% ≤ Stated Concentration

levels. Figure 4 presents the relationship of the natural log value of recorded concentrations to frequency of occurance and allows extrapolation to the geometric mean value.

OZONE: This pollutant is monitored continuously at Site 1. The instrumentation is a MEC Model 1100 (McMillan Electronic Corporation) chemilumenescence analyzer. Data is presented for ninty-six percent of the report period.

Table 19 presents a monthly record of hours sampled and one hour maximums recorded. There were no values recorded which exceed the Ambient Air Quality Standard for this pollutant.

One, eight and twenty four hour maximums and the frequency distribution for all pollutant levels recorded are presented on a quarterly basis in Table 20. Figure 5 represents the Natural log of the concentrations recorded and time.

TOTAL HYDROCARBONS: This pollutant is monitored on a continuous basis at Site 1. Instrumentation is a Mine Safty Appliances Flame Ionization Total Hydrocarbon analyzer. Data is presented for eighty-three percent of the report period.

Table 21 reports hours sampled and maximum three hour values recorded, six to nine A.M., on a monthly basis. These hours are chosen as they were in the establishment of the Ambient Air Quality Standards, to reflect the influence of the morning peak traffic hours. The standard

TABLE 19
OZONE DATA
SITE NUMBER 1
1974

MONTH	HOURS	GEO. MEAN ppm	1 HR. MAX. ppm	NO. OF HOURS 1 HR. STANDARD (0.08 ppm) EXCEEDED
J	659		0.069	0
F	634		0.077	0
M	744		0.060	0
A	713		0.046	0
M	735		0.050	0
J	675		0.054	0
J	733		0.063	0
A	646		0.029	0
S	685		0.059	0
O	739		0.045	0
N	713		0.048	0
D	740		0.043	0
ANNUAL	8416	0.014	0.077	0

TABLE 20
AMBIENT - AIR - OZONE, PPM
SITE NUMBER 1
1974

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Annual	%	Cum %
1 Hr. Maximum	0.077	0.054	0.063	0.048	0.077		
8 Hr. Maximum	0.055	0.045	0.041	0.042	0.055		
24 Hr. Maximum	0.053	0.038	0.027	0.038	0.053		
Concentration Range			Hour				
.010	400	745	1327	478	2950	35.05	35.65
.010 - .019	467	705	552	448	2172	25.81	60.86
.020 - .029	565	367	116	805	1853	22.02	82.88
.030 - .039	388	234	50	414	1086	12.90	95.78
.040 - .049	140	69	14	47	270	3.21	98.99
.050 - .059	53	3	3		59	0.70	99.69
.060 - .069	20		2		22	0.26	99.95
.070 - .079	4				4	0.05	100.00
Total	2037	2123	2064	2192	8416		
Downtime	123	61	144	16	344		
Total Time at Site	2160	2184	2208	2208	8760		

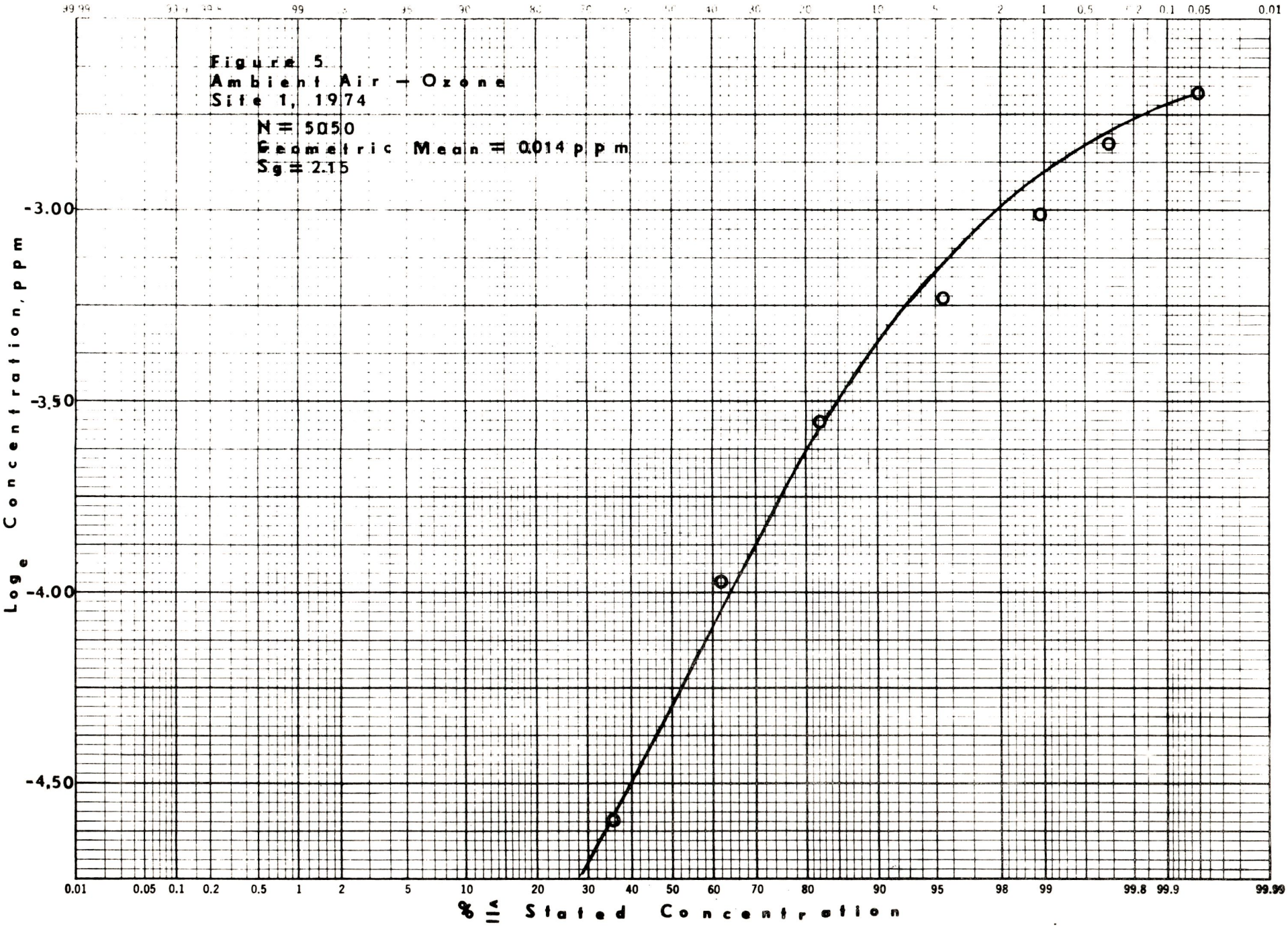
Figure 5
Ambient Air – Ozone
Site 1, 1974
N = 5050
Geometric Mean = 0.014 p p m
Sg = 2.15
Log e Concentration, ppm
-3.00
-3.50
-4.00
-4.50
99.99 99 95 90 80 70 60 50 40 30 20 10 5 2 1 0.5 0.2 0.1 0.05 0.01
0.01 0.05 0.1 0.2 0.5 1 2 5 10 20 30 40 50 60 70 80 90 95 98 99 99.8 99.9 99.99
% ≤ Stated Concentration

for hydrocarbon relates to hydrocarbon concentrations after subtracting methane concentrations. Because instrumentation to measure methane is not available to this agency, no such correction can be made to the values recorded and no attempt is made to relate recorded values to ambient air quality standards.

Maximum one, eight, twenty-four and three hour (6-9 am) concentration are reported in Table 22 on a quarterly basis. A frequency distribution for all values recorded is also presented. Figure 6 represents the relationship of the natural log values of reported concentration to sampling time.

SULFUR DIOXIDE: This pollutant is measured continuously at two sites within the county. Special attention to sulfur dioxide is warrented in view of the Department of Pollution Control ban on new or enlarged sources of this pollutant in Palm Beach County and because of the distances between sources presently located within the county.

Site 1, located in West Palm Beach, Monitors sulfur dioxide levels in the coastal region of the County. Instrumentation for this site is a Beckman 906-A Sulfur Dioxide analyzer based on coulometric titration. Table 23 reports a monthly history of hours sampled, one, four, and twenty four hour maximums and the number violations of each of the related standards. Sampling time represents eighty two percent of the possible hours. Table 24 presents a quarterly and annual record of maximum values and a frequency distribution of values recorded. Figure 7 relates

TABLE 21
TOTAL HYDROCARBONS DATA
SITE NUMBER 1
1974

MONTH	HOURS	3 HR MAX (6 - 9 AM) (a) ppm
J	604	2.5
F	638	2.5
M	734	4.3
A	502	2.6
M	697	3.0
J	717	3.4
J	739	1.8
A	199	1.4
S	259	1.6
O	740	1.6
N	719	2.0
D	743	2.9
Annual	7291	4.3

(a) Standard is 0.24 ppm, 3 hr. Maximum concentration, 6-9 A.M., not to be exceeded more than once a year. This standard is for hydrocarbons, methane corrected, and is not applicable to the values reported above.

TABLE 22
AMBIENT AIR - TOTAL HYDROCARBONS, PPM
SITE NUMBER 1
1974

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Annual	%	Cum %
1 Hr. Maximum	5.8	3.4	2.2	3.8	5.8		
8 Hr. Maximum	4.4	2.6	1.7	2.3	4.4		
24 Hr. Maximum	2.5	2.1	1.5	1.9	2.5		
3 Hr. Maximum 6 - 9 AM	4.3	3.4	1.8	2.9	4.3		
Concentration Range			Hours				
<0.1	7	3	3		13	0.18	0.18
0.1 - 0.5	32	49	144	67	292	4.00	4.18
0.6 - 1.0	496	409	536	1233	2674	36.77	40.86
1.1 - 1.5	970	774	443	778	2965	40.67	81.51
1.6 - 2.0	383	530	70	83	1066	14.62	96.15
2.1 - 2.5	54	126	1	31	212	2.91	99.05
2.6 - 3.0	18	21		8	47	0.64	99.70
3.1 - 3.5	9	4		1	14	0.19	99.89
3.6 - 4.0	3			1	4	0.05	99.95
4.1 - 4.5	2				2	0.03	99.97
4.6 - 5.0	1				1	0.01	99.99
5.1 - 5.5							
5.6 - 6.0	1				1	0.01	100.00
Total	1976	1916	1197	2202	7291		
Total Downtime	184	268	1011	6	1469		
Total Time at Site	2160	2184	2208	2208	8760		

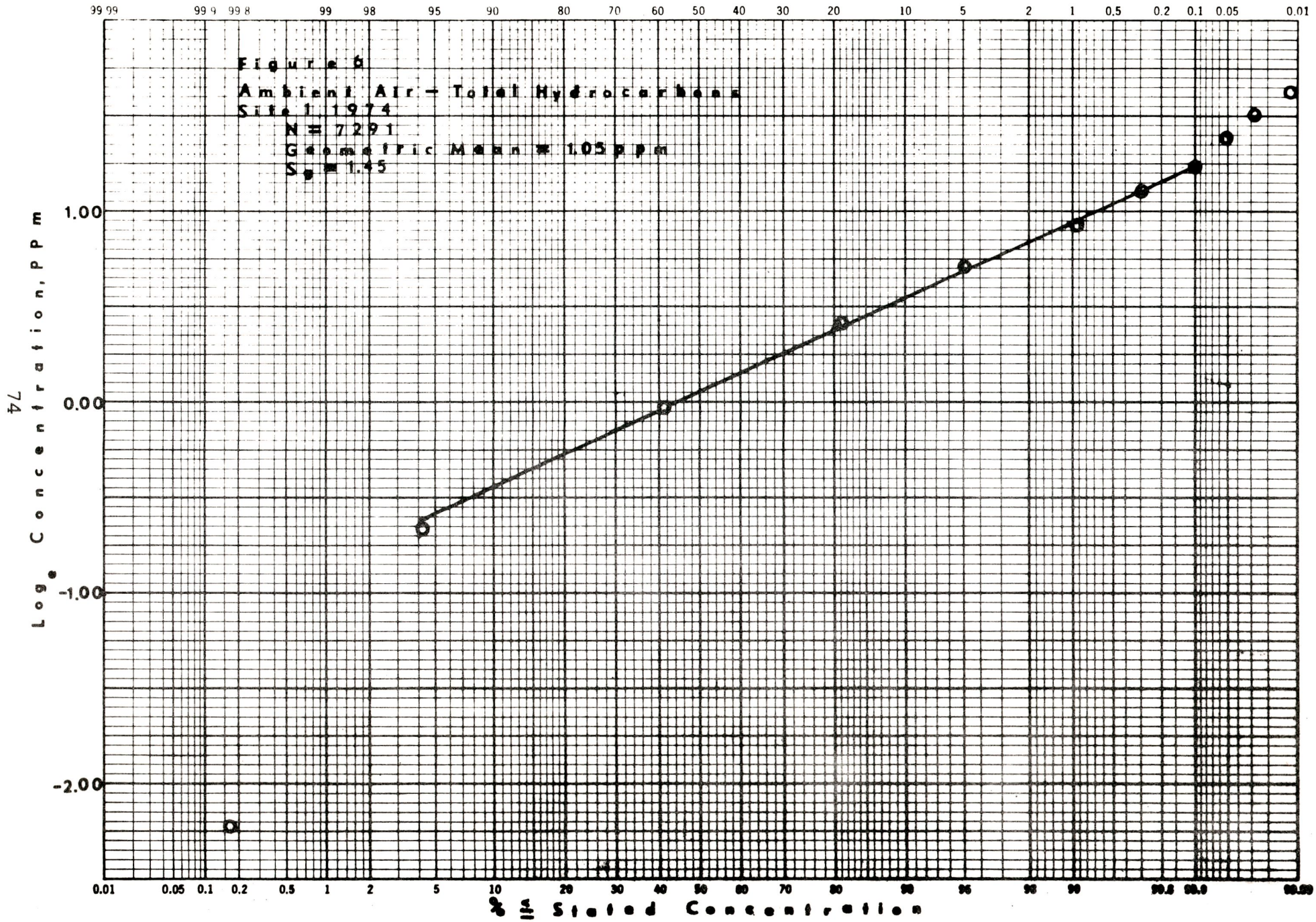
Figure 6
Ambient Air - Total Hydrocarbons
Site 1, 1974
N = 7291
Geometric Mean = 1.05 ppm
Sg = 1.45
Log$_e$ Concentration, PPM
1.00
0.00
-1.00
-2.00
99.99
99.9
99.8
99
98
95
90
80
70
60
50
40
30
20
10
5
2
1
0.5
0.2
0.1
0.05
0.01
0.01
0.05
0.1
0.2
0.5
1
2
5
10
20
30
40
50
60
70
80
90
95
98
99
99.8
99.9
99.99
% ≤ Stated Concentration

these values to time and allows extrapolation to the geometric mean. Calculation of an arithmetic mean for this pollutant is not feasible because ninty two percent of the values are below the limit of sensitivity for the instrument.

Site 8 is located in Belle Glade. Instrumentation at this site is the Technicon Auto-Analyzer for SO_2. Table 25 presents data for the first nine months of 1974. Instrument malfunction prevented the agency from completing the full twelve month study. Monthly hours of sampling, one, four and twenty-four hour maximums are recorded and compared to the comparable standards. Sampling time is fifty eight percent of the possible time.

Table 26 presents a quarterly analysis of the maximums and a frequency distribution of values recorded. Figure 8 relates concentration to time and allows extrapolation to the Geometric mean.

West Palm Beach

TABLE 23
SULFUR, DIOXIDE, DATA
SITE NUMBER 1
1974

MONTH	HOURS	GEO. MEAN ppm	1 HR. MAX. ppm	# HRS. MAX. EXCEEDED (0.100 ppm)	4 HR. MAX. ppm	# TIMES MAX. EXCEEDED (0.020 ppm)	24 HR. MAX. ppm	# TIMES MAX. EXCEEDED (0.010 ppm)
J	694		0.014	0	0.014	0	0.002	0
F	638		0.026	0	0.025	9	0.020	2
M	678		0.027	0	0.027	3	0.017	1
A	637		0.023	0	0.023	7	0.021	6
M	740		0.041	0	0.030	5	0.014	3
J	514		0.075	0	0.050	2	0.011	1
J	126		0.003	0	0.002	0	0.001	0
A	664		0.026	0	0.025	6	0.023	1
S	560		0.015	0	0.014	0	0.004	0
O	532		0.027	0	0.013	0	0.006	0
N	694		0.013	0	0.009	0	0.006	0
D	676		0.013	0	0.009	0	0.006	0
Annual	7153	0.002	0.075	0	0.050	32	0.023	14

West Palm Beach

TABLE 24
AMBIENT AIR - SULFUR DIOXIDE, PPM
SITE NUMBER 1

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Annual	%	Cum %
1 Hr. Maximum	0.027	0.075	0.026	0.027	0.075		
3 Hr. Maximum	0.027	0.052	0.026	0.016	0.052		
4 Hr. Maximum	0.027	0.050	0.025	0.013	0.050		
24 Hr. Maximum	0.020	0.021	0.023	0.006	0.023		
Geo. Mean					0.002		
Concentration Range PPM			Hours				
<0.010	1807	1565	1310	1890	6572	91.88	91.88
0.010-0.014	105	152	11	11	279	3.91	95.78
0.015-0.019	55	108	7		170	2.38	98.15
0.020-0.024	35	51	15		101	1.41	99.57
0.025-0.029	8	7	7	1	23	0.32	99.89
0.030-0.034		4			4	0.06	99.94
0.035-0.039							
0.040-0.044		1			1	0.01	99.96
0.045-0.049		1			1	0.01	99.97
0.050-0.054		1			1	0.01	99.99
0.055-0.059							
0.060-0.064							
0.065-0.069							
0.070-0.074							
0.075-0.079		1			1	0.01	100.00
Total	2010	1891	1350	1902	7153		
Total Downtime	150	293	858	306	1607		
Total Time at Site	2160	2184	2208	2208	8760		

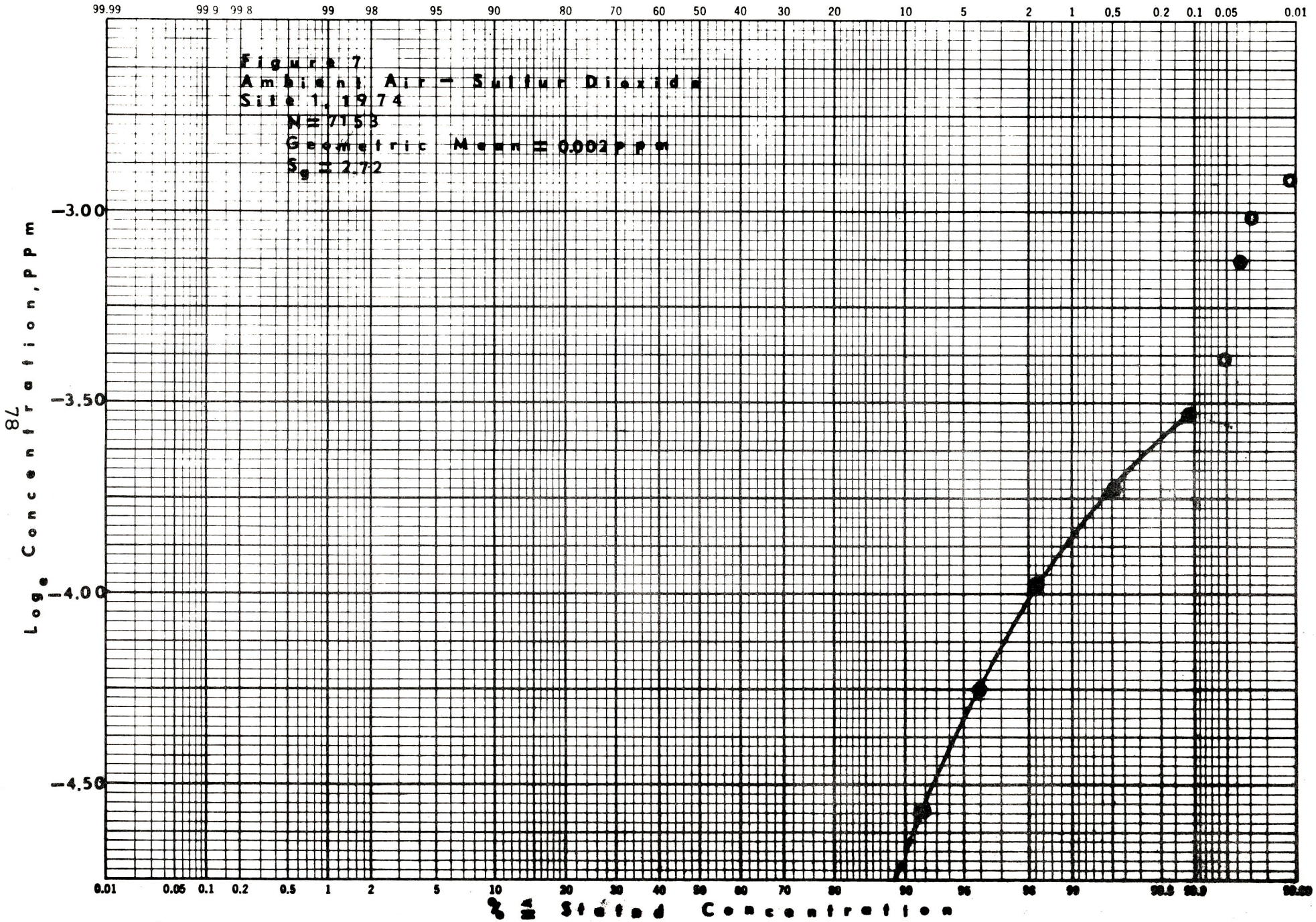
Figure 7
Ambient Air – Sulfur Dioxide
Site 1, 1974
N = 7158
Geometric Mean = 0.002 ppm
S_g = 2.72
99.99
99.9
99.8
99
98
95
90
80
70
60
50
40
30
20
10
5
2
1
0.5
0.2
0.1
0.05
0.01
-3.00
-3.50
-4.00
-4.50
Log$_e$ Concentration, PPM
0.01
0.05
0.1
0.2
0.5
1
2
5
10
20
30
40
50
60
70
80
90
95
98
99
99.8
99.9
99.99
% of Stated Concentration

Belle Glade

TABLE 25
SULFUR DIOXIDE DATA
SITE NUMBER 8
1974

MONTH	HOURS	GEO. MEAN ppm	1 HR. MAX ppm	# HR. MAX. EXCEEDED (0.100 ppm)	4 HR. MAX. ppm	# TIMES MAX. EXCEEDED (0.020 ppm)	24 HR. MAX. ppm	# TIMES MAX. EXCEEDED (0.010 ppm)
J	300		0.012	0	0.003	0	<0.001	0
F	528		<0.010	0	<0.010	0	<0.010	0
M	718		<0.010	0	<0.010	0	<0.010	0
A	653		0.065	0	0.023	1	0.004	0
M	568		<0.010	0	<0.010	0	<0.010	0
J	488		<0.010	0	<0.010	0	<0.010	0
J	619		<0.010	0	<0.010	0	<0.010	0
A	551		0.028	0	0.007	0	0.001	0
S	625		0.053	0	0.013	0	0.004	0
O	0							
N	0							
D	0							
Annual	5050	.0001		0		1		0

Belle Glade

TABLE 26
AMBIENT AIR - SULFUR DIOXIDE, PPM
SITE NUMBER 8
1974

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Annual	%	Cum%
1 Hr. Maximum	0.012	0.065	0.053		0.065		
3 Hr. Maximum	0.004	0.031	0.018		0.031		
4 Hr. Maximum	0.003	0.023	0.013		0.023		
24 Hr. Maximum	<0.001	0.004	0.004		0.004		
Geometric Mean					0.00008		
Concentration Range			Hours				
<.010	1545	1706	1767		5018	99.37	99.37
.010-.019	1	2	21		24	0.48	99.84
.020-.029			6		6	0.12	99.96
.030-.039							
.040-.049							
.050-.059			1		1	0.02	99.98
.060-.069		1			1	0.02	100.00
Total	1546	1709	1795	0	5050		
Total Downtime	614	475	413	2208	3710		
Total Time at Site	2160	2184	2208	2208	8760		

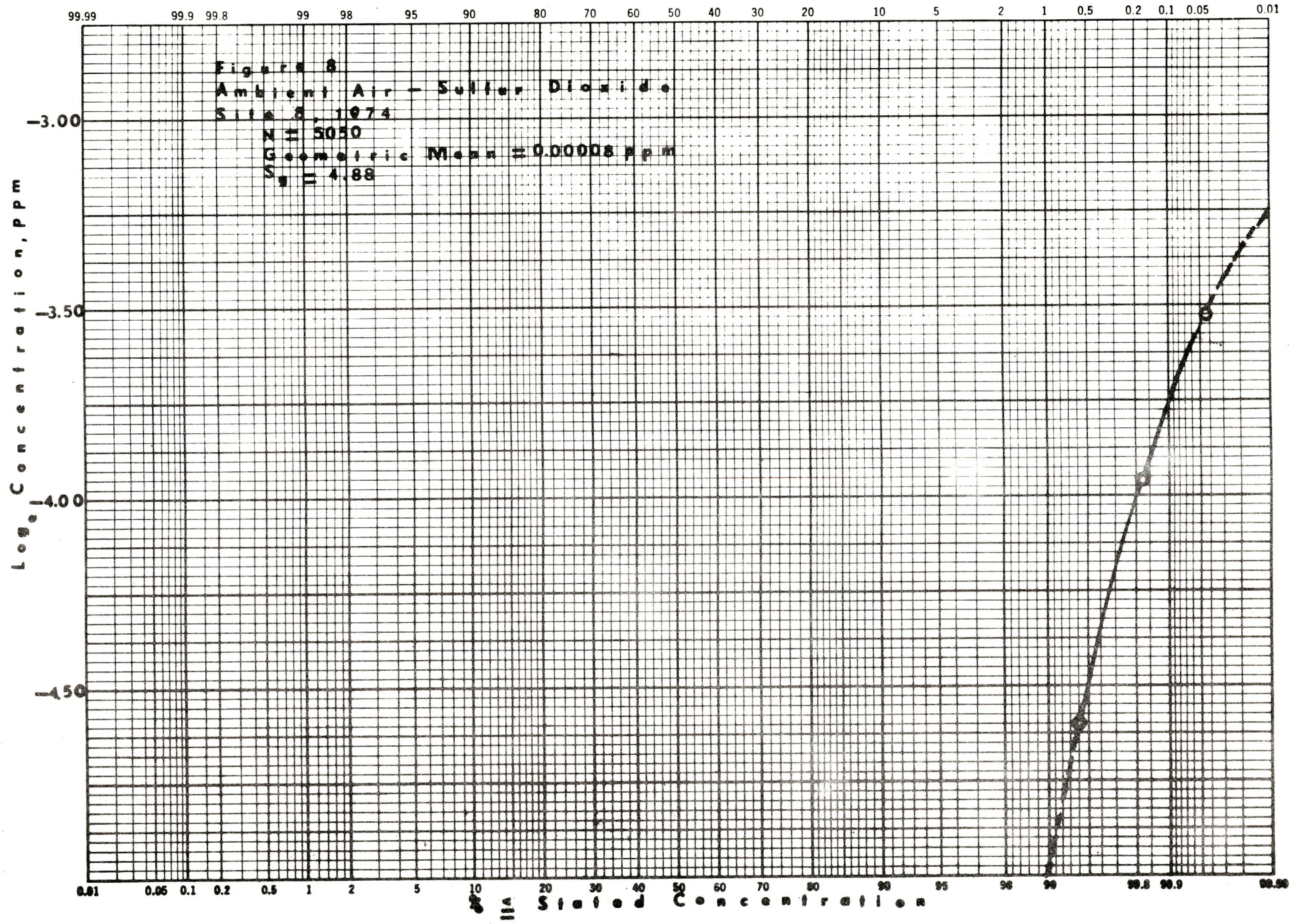
Figure 8
Ambient Air – Sulfur Dioxide
Site 8, 1974
N = 5050
Geometric Mean = 0.00008 ppm
Sg = 4.88
Log10 Concentration, PPM
-3.00
-3.50
-4.00
-4.50
99.99 99.9 99.8 99 98 95 90 80 70 60 50 40 30 20 10 5 2 1 0.5 0.2 0.1 0.05 0.01
0.01 0.05 0.1 0.2 0.5 1 2 5 10 20 30 40 50 60 70 80 90 95 98 99 99.8 99.9 99.99
% ≤ Stated Concentration

IX
EMISSION INVENTORY

INTRODUCTION

The Emission Inventory presented in this report represents the calculated emissions within the County for the calendar year 1974. Changes to be noted in the major categories are:

(1) Transportation emissions have been expanded to include emissions from Inboard Vessels (In-Berth).

(2) Industrial emissions will now reflect the emissions, reported in previous years, from the Residential and Commercial Heating and Cooling category.

(3) Mineral Products, Food and Agriculture, Evaporation Loss emissions, have listed under each category, its appropriate source. This was done in order to better understand the Emission Inventory.

(4) Solid Waste Disposal category was expanded to include emissions from Open Burning (Land Clearing) in addition to the Open Burning emission previously reported from Solid Waste Disposal sites.

(5) Residential and Commercial Heating and Cooling emissions will now be reflected in the Industrial Emissions category - Industrial Process. This was done in order to simplify the Emission Inventory. The individual pollutants reported includes: Aldehydes; Carbon Monoxide; Hydrocarbons; Oxides of Nitrogen (calculated as nitrogen dioxide); oxides of sulfur (culculated as sulfur dioxides); and particulates. Emission factors applied for these pollutants are to be

found in Compilation of Air Pollutant Emission Factors, second Edition, April, 1973, published by the U.S. Environmental Protection Agency, Office of Air and Water Programs, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.

Methodology

Major fuel users, suppliers, and industries were surveyed for purposes of this report. Population figures were obtained from the Palm Beach County Area Planning Board and reflect an increase in population. Climatological data was supplied by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration.

DISCUSSION AND RESULTS

TRANSPORTATION:

Motor Vehicles: Calculated emissions from this source are based on annual fuel sales reported by the Florida Department of Agriculture and Consumer Services. A slight increase in gas consumption was shown for this reporting period over 1973 figures. All calculations were based on sales, converting sales into total vehicle miles traveled (VMT), multiplied by an average route speed of 35 m.p.h. A speed correction factor was used to find the 1974 corrected emission factor. This corrected emission factor was used to calculate the actual emissions. This calculation reflects the increasing proportion of vehicles equipped with pollution control devices within an expanding automotive population.

Aircraft: Decreases in this category reflect a fuel crisis, and general econonic conditions which reduced air traffic activities for 1974.

Locomotive: Increases within this category reflect actual train traffic, fuel consumption, and unit miles of railroad track by the Seaboard Coast Line and Florida East Coast Railroad lines.

Inboard Vessels (In-Berth): This source is included for the first time in this report. Figures used to compute emissions were furnished by the Port of Palm Beach.

INDUSTRIAL:

Steam Electric: Emissions from this source continue to be relatively stable.

Industrial Process: This source includes emissions from processing plants, major pumping stations, boilers used for processes, and emission from domestic and commercial heating. Increased fuel oil and natural gas consumption, plus the incorporation of residential and commercial heating and cooling emissions into this category have significantly increased the emissions for this category.

Aircraft: Emissions in this category have remained relatively stable.

MINERAL PRODUCTS:

Asphalt Batching: Emissions in this category have remained relatively stable.

Concrete Batching: Decrease within this category reflects a general economic "stop" in the concrete related industries.

FOOD AND AGRICULTURE:

Sugar Cane Processing: Emissions calculated from this source reflect actual amounts of residual fuel and bagasse consumed because of the increase in the sugar production quota for the 74-75 season.

Sugar Field Burning: This source is included for the first time, as a seperate category, in applying emission factors to the estimated acres burned for the 74-75 season.

EVAPORATION LOSS:

Dry Cleaning: This source is included for the first time and includes an estimation of solvent consumption used throughtout the County.

Surface Coating: This source is included for the first time and includes an estimation of the types of coatings used throughout the County.

Petroleum Storage and Gasoline Marketing: These sources have been reported in previous years with the Motor Vehicles Emissions. The separation which has occured this year is being done in order to categorize emission sources with emission categories.

SOLID WASTE DISPOSAL:

Refuse Incineration: Increases in this category may be attributed to changes in operational factors.

Open Burning (Land Clearing): Improved operational practices of dumps has been offset by the inclusion of Land Clearing - Open Burning for this reporting period. Estimation of the total number of acres burned in Land Clearing has been

computed from this agency's Open Burning briefing inspections, and from information supplied by the Division of Forestry.

TABLE 30
SUMMARY OF AIR POLLUTION EMISSIONS IN PALM BEACH COUNTY 1974 (T/YR.)

SOURCE	ALD	CO	HC	NO_2	SO_2	SO_3	PART	TOTAL	%
TRANSPORTATION									
Motor Vehicles	9	103,787	16,222	17,665	695		1819	140,197	29.31
Aircraft	< 1	1521	128	110	13		8	1780	0.37
Locomotives	< 1	195	141	556	86	< 1	38	1016	0.21
Inboard Vessels (In-Berth)	< 1	2	1	2	3	< 1	1	9	< 0.01
Total	9	105505	16492	18333	797	< 1	1866	143002	29.89
INDUSTRIAL									
Steam Electric	58	524	125	10975	13937	326	588	26533	5.55
Industrial Process	31	143	85	1052	5153	67	435	6966	1.45
Aircraft Industry	24	208	61	293	587	8	228	1409	0.29
Total	113	875	271	12320	19677	401	1251	34908	7.30
MINERAL PRODUCTS									
Asphalt Concrete Plants	1	4	3	35	225	3	147	418	0.09
Concrete Batching							106	106	0.02
Total	1	4	3	35	225	3	253	524	0.11
FOOD AND AGRICULTURE									
Sugar Cane Processing	9	36	27	360	3956	50	10264	14702	3.07
Sugar Field Burning		186300	37260	3726			27945	255231	53.36
Total	9	186336	37287	4086	3956	50	38209	269933	56.43
EVAPORATION LOSS									
Dry Cleaning			30					30	< 0.01
Surface Coating			427					427	0.09
Petroleum Storage			1167					1167	0.24
Gasoline Marketing			2149					2149	0.45
Total			3773					3773	0.79
SOLID WASTE DISPOSAL									
Refuse Incineration		298	51	28	22		138	537	0.11
Open Burning (Land Clearing)		18470	3694	369	< 1		3140	25673	5.37
Total		18768	3745	397	22		3278	26210	5.48
TOTAL	132	311488	61571	35171	24677	454	44857	478350	100.00